RURAL ECONOMY

A Treasury of Information

ON THE

HORSE, PONY, MULE, ASS, COW-KEEPING, SHEEP, PIGS, GOAT, HONEY-BEE, POULTRY, ETC.

BY

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"SMALL FARMS," "COMMON THINGS OF EVERY-DAY LIFE," ETC. ETC.

LONDON:

G. ROUTLEDGE & CO. FARRINGDON STREET;

NEW YORK: 18, BEEKMAN STREET.

1857.

PREFATORY REMARKS.

The matter of the following pages appeared in detached articles in a popular periodical. Most of them were contributed by me; and those which were not have been now carefully revised, and partly re-written.

Martin Doyle.

April, 1857.

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RURAL ECONOMY.

THE HORSE.

CHAPTER I.

Description of horse desirable—Breeds introduced into England—The Galloway—Points desirable—Handling and training—Stable management—Pasture feeding—Maladies and their causes—Clipping—Quantity of food—Water—Chaff.

A Horse perfectly suited to the various purposes of drawing a light carriage or cart on the road, performing the small farmer's field work, and bearing a saddle and rider on occasions, is one of the most useful of its species; but requiring the combined qualifications of strength, activity, hardihood, gentleness, and sure-footedness, it—like an excellent servant-of-all-work of the human kind—is not very easily procurable, notwithstanding specious advertisements and testimonials of character, given in a very confident manner.

The person in search of a horse for all the foregoing purposes ought not to calculate on obtaining one of unqualified excellence in all those departments of service: it would be unreasonable to expect that the stout animal which could easily draw a family party in a four-wheel carriage, or a tax cart, through miry roads, should be able to trot as fast as a butcher's hack, which is generally kept moving at the rate of sixteen miles an hour. A light-bodied, slender-limbed, active, fast-stepping horse, though suited to rapid movements, with saddle or harness,

on a hasty mission, such as that of Obadiah on the back of a heavy-work horse, in search of Doctor Slop, could not effectually do the proper work of the draught-horse, and if able to speak, might fairly say, "this is no fit business for me." The mere hunter, racer, charger, roadster, or draught-horse for any special labour, is more easily found in a fair or horse sale repository, than the horse-of-all-work, because they have appropriate qualities of points, form, and temper, which are plainly distinguishable to any judge of horse-flesh; whereas the horse from which many varied services are expected, should possess qualifications more or less directly suited to the nature of such services.

It is an interesting fact, that God has permitted his creature man so to modify and alter the ordinary size, form, habits, and peculiarities of the important domestic brute animals, by a judicious selection of parents designed for propagating new generations, that in various instances the sort of animal best suited to the condition in which it is to be placed, or to the purpose for which it is specially wanted, is generated. A remarkable case of this nature is presented in the adaptation of the horse,—through the care and skilfulness of man exercised in its breeding and training,—to the different purposes for which it is used. A few remarks will sufficiently illustrate this fact.

Breeds introduced into England.

Eight centuries ago, the Normans introduced into England the powerful, active, and spirited war-horse of the knight, and the smooth-gaited but inferior hackney of his esquire, and the ladies' ambling palfrey, so necessary to their convenience, when there were neither roads nor carriages for intercourse between the then lordly castles.

Besides these three descriptions of horse, the humble pack-horse was brought,—also an importation from

France,—as a drudge for bearing back-loads; and in subsequent periods, the heavy Flemish draught-horse, and the Arabian, were also brought and crossed with the Norman and the native breed, which possibly was of no mean character, for we read of "scythed chariots drawn by fiery steeds," in use among the ancient Britons, who opposed the Roman legions.

From those types of their respective kinds have arisen the excellent varieties of the horse for which England—so much in advance of France, which supplied the original types—is now so distinguished. Does a London brewer want a dray-horse of enormous size and strength? he seeks one descended from Flemish origin, and increased in magnitude and power, by the breeder's care, greatly beyond its original type. Are first-rate coach-horses required? they are sought (or rather used to be, for they are almost extinct), among the Cleveland race, which descended from the Norman kind. Is a superior horse wanted for the plough and the cart, or to take the farmer to market? he will find in the Suffolk punch, which was first produced by a cross between the Norman sire and the Suffolk cart mare, exactly what he wants. If he only wants a team of first-rate horses for farm labour, he seeks for the Clydesdale breed. And is a horse wanted for the different purposes defined at the commencement of this chapter? a purchaser cannot commit a great blunder if he succeed in obtaining one of the Galloway breed, or approaching as nearly as possible in all its points to the hardy, active, and stout animal known by that designation.

"Galloway" is now used, however, as a term for any horse between the pony size and the hack; and in this point of view is sufficiently numerous. The true Galloway is somewhat larger than the Welsh horse, and is said to resemble the Spanish horse. Such of this breed as have been preserved in any degree of purity, are of a light bay or brown colour, with black legs, and are easily distinguished by the small-

ness of their head and neck, and the cleanness of their bones.

Besides having legs of a black colour, it is important that a horse's legs should be well formed and well set: as a general rule, a line drawn from the point of the toe —as the horse stands in proper attiude—to the point of the shoulder, should be quite vertical; the neck should neither be too short nor too long, and for safety as well as appearance, it should rise in a graceful curve. If speed only be the object, a low forepart is desirable, and a narrow, upright shoulder; but who that regards his own security would like to ride an animal so formed? and how badly does it look with a low, poking neck in harness. Yet, since a low and upright shoulder, thick at top, is the best for a dead pull, a person who wants a horse to work in the plough and dung-cart, and also to draw a light phaeton, and bear a rider, must seek for the right medium between a heavy and a light shoulder, clumsy and too thin limbs, a heavy paunch and a very light carcase; and as to other points, he must consider what on the whole will best answer his purposes. He will, under any circumstances, be disposed—if he knows anything of a horse's points—to reject one that has long posterns, heavy flat hooves, flat ribs, bad hind quarters, and is deficient in breadth over the loins. With from £30 to £40 in his pocket, a man may buy the sort of middle-sized animal he requires, if he be a good judge of horse-flesh, or have the assistance of an honest horse buyer.

Handling and Training.

The horse should be tenderly handled from the earliest age; familiarized to man, so that it will not contract the dangerous habits of biting and kicking at him, which are the consequences of bad education, and the natural instinctive efforts of self-defence against oppression.

But though a horse should be handled from an early

age, it should not be worked with regularity or severely before its fourth year, though it may do light work a year sooner: and it should have a summer's run at grass in the third year, and the fourth also. Its muscular strength ought to be established before it is put to hard labour. Horses of any sort, prematurely worked (and they are not of full strength until the fifth year), become worn out before their time.

The work of a horse should be limited at first to carrying a light back-load, or drawing a lightly-loaded cart; and the best way of training a horse to bear the resistance of weight, is to yoke it alongside of a trained one, and teach it to pull by degrees, slackening the traces when it feels the pull at the collar unpleasant, until it becomes accustomed to it.

After a little practice in this way, it will very soon bear the shafts of the cart, and disregard the rattling of the wheels, and learn to draw in single harness. Patience and gentleness, on the part of the trainer, are indispensable to the docility of a young horse. A passionate man, who forces the collar over its head, or a snaffle or bit into its mouth, hurting its teeth and jaws, or who beats it on the head, or kicks it on the ribs when it is afraid to move forwards, or who flogs the tender and timid animal if it makes a false step, when its inexperienced limbs cannot move with ease and security on a rough road, ought to be dismissed without ceremony. The future intractability of the animal may be the consequence of the ignorance, stupidity, or ill temper of its first trainer, who, by his folly and stupidity, teaches it to resist his authority (to which, under proper treatment, it would easily have been brought to submit), unless the poor thing is so heart-broken and stupified by tyrannical abuse, as to lose its natural sagacity.

The docility of the horse, under judicious management, is wonderful; no animal, except the dog, is so capable of being rendered the companion of man. No other creature can be brought, by gentleness and

patience, to face what it naturally fears extremely. For instance, the cavalry and artillery horses stand fire unflinchingly, and hear the thunders of the cannon without apparent dismay. So do the horses of the circus exhibit astonishing feats, which are the results of training.

Any horse, gently handled in its early years—patted playfully at proper times—fed from the hand with a bit of carrot, or with oats—may be taught to follow its master, or remain steadily by his side, though at liberty all the while to escape from him. In short, the horse, like the dog, may be taught to obey the voice and gesture of its master.

But, frequently, everything is done to crush the spirit of the sensitive horse. If it exhibit nervous alarm at some new object, it is flogged or spurred, and—as the natural consequence—when it next sees the same object, it feels increased terror, because it has not only to contend with the instinctive apprehension which the object of alarm itself occasions, but also with the associated fear of whip or spur.

The methods of treatment which ignorant and intemperate men pursue, to conquer the nervous startings of a horse, are precisely those which are most likely to confirm them. Gentleness, then, with a young horse under training, and appropriate language (which it soon sufficiently understands), instead of harshness of manner and the crack of a whip, should be invariably exercised. The sounds of gentleness and caressing kindness are quite intelligible to all sagacious domestic animals, and the horse is no exception to this fact. The voice of a gentle female, when she pats her horse with kindness, is always agreeable to it, because it associates with her voice tenderness and security from any manifestation of tyranny, or a desire to torment.

Stable Management.

If there be a hay-rack in the stable, and it can be conveniently removed, get rid of it, and retain the manger; with some necessary re-arrangement of it, a box-manger is sufficient for all feeding purposes. As the rack is so much above the horse's head, the poor animal is obliged to strain its neck in order to reach a mouthful of hay. In its natural state, at pasture, the horse pokes its head to the ground; but standing at the rack, the head is elevated in an unnatural position.

Every person who keeps horses knows that a great deal of hay is frequently left in the rack to save the trouble of renewing the allowance, and in livery stables hay is purposely packed tightly in the rack, in order that the horses may not pull it out without difficulty. The foul air of the stable, too, added to the breathing of horses on it, renders the hay so unpalatable to them, that less of it is consumed (as livery stable-keepers well know) than would be the case if it were supplied fresh, and shaken loosely into the rack.

The sufficiency of the box-manger alone will more fully appear when we shall have detailed the manner of feeding a horse kept for the purposes stated in the beginning.

We shall suppose that the horse-of-all-work is fed in winter on hay, oats, straw, pollard, bruised furze, potatoes, and carrots. As the hay and straw ought to be cut into chaff, and mixed with the allowance of oats, the rack is useless for such food; and it is inconvenient in summer for holding clover, vetches, or other green food. Away, then, with the rack, and substitute for it a box-manger. This, however, should be often washed, especially after holding boiled roots, or mashes of any kind; but cleanliness, in this instance, costs nothing. The stable, with a view to the economy of manure, is the fit place for a horse to rest in by day and night; if, however, a small loose yard

can be penned off outside the stable-door, its health and the free action of its limbs will be improved, by having the liberty of moving about in it, and this, too, without loss of manure. Such a mode of management is very practicable in many instances.

Pasture Feeding.

It is pleasant to see a horse gambolling about in a pasture-field during the summer; and in numerous cases it is advantageous to turn it out to grass. The animal evidently enjoys freedom, as it testifies by kicking up its heels, like a schoolboy when let loose from the school-room. If there be a suitable pasture-field for the horse, it should not be turned on it, however, until the growth of grasses is well advanced, for if these be nipped too early, the plants are injured, and retarded in their growth; and any horse being obliged to fall back upon dry food, feels a distaste for it, which would not be the case if it had not cropped the green blade.

Besides the loss of manure sustained by pasturing a horse frequently, there is another objection to its being turned out on grass, namely, the danger of its being injured by a kick from some vicious horse, or the thrust of a cow's horn. Many horses limp home with broken limbs from a pasture-field. The stable then, all circumstances considered, is generally the best place for any sort of horse.

Maladies and their Causes.

Although the horse deserves every care, and is in some respects no less liable than his master to diseases, arising from over-feeding or insufficiency of food, bad water, bad ventilation, cold and unequal currents of air, and checked perspiration, it is frequently his fate to suffer from some or all of those fruitful sources of malady.

In a state of nature, the horse knows few or no ailments; pure water, grass, and free air keep him in

high spirits,—but in the artificial state in which he is placed, when in stable, his treatment is often quite contrary to what his natural mode of life would prescribe. Perhaps he is confined in a low-ceiled, close stable from which pure air is shut out, except when the door is opened, and a sudden rush of air is driven towards him: litter is left by day and night under him, while the hartshorn which arises from it is so powerful, as to make the eyes of any person who enters the stable smart and weep. Perhaps his body is swathed in heavy clothing, even in warm weather, with a girth so tight as to obstruct the free expansion of the stomach and lungs, to save the manual labour of wisping and brushing, and produce a sleek skin at the expense of the animal's comfort. No wonder when a horse is led out naked in cold weather, and kept standing perhaps for many minutes at repeated intervals, that a heavy cough, and all its train of consequences, should ensue. However, I need not dwell on this point, as few men would keep a horse-of-all-work in body clothes—decidedly not, if field labours are to be required of it.

To revert to close stabling, however, and fermenting litter,—common sense suggests that fresh air is specially necessary to the health and comfort of a horse. If any one doubts it, let him visit crowded stables with confined air, and where heated litter is generally under a horse, and he will hear coughing and perceive weak eyes, and legs swelled and perhaps full of grease, which may be attributed to the irritating effects of the fermenting manure and the ammoniacal litter.

If motives of economy lead a person who wishes to collect the largest possible quantity of manure, by means of straw laid for litter, let him consider that it may be "penny wise and pound foolish" to do so. Warm straw under a horse's feet constantly, must tend to excite inflammation in them, and so certain is this, that a very distinguished writer on our subject has recorded the result of a long experience, in these words:—"The con-

stant use of litter heats, and makes the feet tender, and causes swelled legs; moreover, it renders the animal delicate. Swelled legs may frequently be reduced to their proper natural size by taking away the litter only. I have seen, by repeated experiments, legs swell and unswell, by leaving litter or taking it away." Litter, when forked out, should not be heaped up close to the door or window; its exhalations even outside, if close to the stable, must in some degree affect the air of it; it should be moved to some distance.

A horse should be regularly wisped and brushed when in stable, even though it be employed in common labour; and if its legs be wet, they should be hand-rubbed and brushed until they become perfectly dry. The cracked heels, which are so common, frequently arise from neglect in this particular. A horse's heels, unprotected by much hair, and reeking with moisture, are quickly affected by the evaporation from them, caused by the warmth of the litter, and rendered sore and broken in consequence, just as frozen plants, when exposed to the sun's rays, become burned by the rapid escape of the warmth which they had contained. It is very wrong, therefore, to lead horses in winter to ponds or rivers, if they are to be stabled immediately afterwards, unless the heels and legs be rubbed quite dry, or are protected from this evaporation by such a mass of hair as the true cart-horse is supplied with by its Creator, and of which it should not be deprived. A very high-bred horse has so little hair over the heels, that he does not require the shears there; but horses of lower gradations,—such as are the subjects of this article—should have their heels trimmed, but not so as to leave them without a small pendant lock.

Clipping.

If the horse's coat be long and staring, or, in other words, if the use of water too hard to dissolve soap, or any source of unhealthiness, should cause imperfect or

slow moulting of the hair, with fair grooming, it should be clipped cleanly off, provided the horse has not occasion to stand in chilling air at any work. If he be kept for a carriage or the saddle only, clipping will render even a sluggish and spiritless (because unhealthy) horse active and spirited; instead of suffering perhaps during an entire night from the cold and continuing wetness of skin from the exercise of the previous day, the clipped skin will become immediately dry and warm after rubbing, and no obstructed sweat will break out again. But a woollen cloth should be thrown over the back and loins of the shorn horse, not only during his confinement in the stable, but whenever he should have occasion to stand still for any length of time when out of doors.

Quantity of Food.

The food of the sort of animal under our particular observation now, may be calculated at about a third more of hay and oats than I shall assume, in the following paper, to be requisite for the sustenance of a small pony. The quantity of corn should be regulated by the proportion of fodder given, and the degree of work to be performed. If straw chaff be allowed without stint, and with a liberal allowance of corn, a very small portion indeed of hay (this should be sweet and well got up) will suffice.

A moderate supply of green food in spring is the most simple and natural physic for a horse which has been corn-fed during the winter; the constipation arising from a long dietary of oats and sapless hay is removed without the pains and gripings and exhaustion which doses of aloes and such other purgatives occasion, and therefore is a necessary alterative, either preventive or remedial, of many disorders arising from a long use of stimulating food.

During the winter months, bran or boiled barley should be given to a horse fed on hard food at least

twice a week, to keep the bowels in a perfectly free condition. And if such regimen be duly observed, the severe bleeding and physicing to which so many horses are regularly subjected in spring and autumn, whether in a healthy state or otherwise, will rarely be resorted to from necessity. But in regulating the use of succulent food, such as meadow grass, clover, vetches and lucern (though the caution will apply to any sort of food), care should be taken not to give more than small portions at a time, when a horse is wanted for any exertion soon afterwards. Let a man, after stuffing himself with a full dinner, get up and run, wrestle, or play at leap-frog or cricket, and he will experience something of the sensations of a horse put to smart work on a full stomach, and more particularly if it be loaded with food of a flatulent quality. Green food, given in moderation and at proper times, causes the coat of a horse to become silky, which is generally a proof of health.

Water.

In my younger days, horses—except those for field and common cart work—were too frequently limited exceedingly in drink. Hunters and carriage horses were rarely watered, except once a day; therefore, with the thirst occasioned by dry food, they felt a desire to fill the stomach with water when taken out to drink: to prevent the bad consequences to their wind, from the obstruction in the free action of the lungs which the distension of the stomach always causes, the quantity of liquid was limited to a certain number of gulps, which the groom counted, and then the mouth of the still thirsting animal was pulled from the stream, and he was left during twenty-four hours under the torturing sensation of unsatisfied thirst.

By the present rational practice, a horse may dip his lips frequently in a pail of water during the day, and therefore he never drinks to hurtful excess. And one

of the consequences of this humane treatment is, that asthmatic and broken-winded horses are much more rarely seen than when the opposite system was rigidly pursued. Soft water, such as that in which soap will readily break, is the best for horses. Hard water, or any that is loaded with certain mineral substances, is apt to cause, besides a staring coat, many serious disorders. If hard pump water only can be procured, it should be raised some hours and kept in a warm atmosphere before it is given to the horse. In the other extreme, foul pond water, even without the addition of the liquids from the stable-yard which may flow into it, is unwholesome. A horse, if not too warm, may at any time, when in exercise, be allowed to drink a little water; it cools and refreshes, without doing any injury.

The common practice is to give horses, when baiting on a journey, corn first, and then water. Diluting the food with drink in some degree seems natural, and it can matter little whether the needful portion be given before, after, or during the feeding; but it is important to avoid an over-quantity of corn and water at the same time. Horses have been known to die from the bursting of the stomach, even with moderate exercise, when too much filled with barley and water. This grain, in a wet state, swells, and distends the coats of the stomach.

To prevent a greedy horse from swallowing his corn without chewing it, cut straw or hay (chaff) should always be mixed with it. The bruising of corn in a mill, though it has many advocates on the plea of economy, has also many opponents, who maintain that though the horse does not in such case void from his stomach undigested grains, the action of his teeth and jaws in masticating what he does chew, causes it by the mixture of saliva, to become chyle or true food in the stomach, which otherwise it would not be in the same degree.

If a horse on a journey cannot be allowed much time for consuming a small feed of oats and a little hay, or is fatigued and will not eat oats, the best restorative food

he can get is oatmeal, slightly wetted with water;—if watered to the consistence of porridge or gruel, it becomes laxative, and therefore unfit for the strengthening of the horse. Some horses will not eat it, or dry bran, and it is difficult to manage such fastidious and tender ones.

In Germany, coarse black rye bread is constantly given, on journeys, to horses; and as the stomach of a horse is very small, in proportion to his body, a little piece of solid and nutritive food, well prepared and often given (for his digestion is quick), is really better for him on a journey than a greater bulk of ordinary food, which may impede the progress of his breathing. A horse brought into stable from grass should not be fed too suddenly with corn, or reduced all at once to a hard diet; he should be gradually relieved by moderate work or exercise — producing perspiration from the gross humours engendered in his body while at pasture, and brought by degrees to the hard winter diet. Boiled or steamed food occasionally is wholesome and economical for our horse-of-all-work.

THE PONY.

CHAPTER II.

Cruel treatment of ponies—Points of a pony—Quantity and cost of food.

MANY persons, besides those who keep a pony for drawing a little gig or phæton, have need of one to draw a common cart, to execute the light drill work of a market garden, or for jobbing.

The great improvements in the construction of all wheel carriages, and of roads—but still more so, perhaps, the legal exemption from taxes, of horses not exceeding twelve hands in height—have led to the very extended increase, in England, of dwarf ponies. These little creatures, from the rate of speed frequently required of them, and the heavy loads imposed on them, are over-driven and over-weighted. Some of them, though only formed for active movements, and for drawing very light weights, are often loaded as if they were strong, full-sized horses.

While I was writing this, a diminutive pony passed my window, drawing three men and two women, at a furious rate; and a short time before, two middle-sized dogs rushed along the same road, panting from the fatigue of drawing a large man and a woman in a cart. Both, especially the latter of these instances, were unquestionably acts of tyrannical cruelty; yet this case could plead, until within a recent period, the implied sanction of the British Parliament—the friends of humanity in the House of Commons having there

failed repeatedly in their efforts to save the dog from such cruelty, except within a prescribed distance of the streets of the metropolis.

The other abuse is the result of a well-intended Act of Parliament, which until lately exempted from tax the owner of a small pony, when it was not anticipated that motives of parsimony, or too rigid economy, would lead to the substitution of such an animal for a large horse in many very severe labours, utterly disproportioned to its powers.

Points of a Pony.

The person in search of a pony to draw a moderate load, and for slow work, may find some of the following remarks useful to him:—

First, as to the form of a pony designed for labour and slow draught;—The legs and posterns should be short, the ribs and quarters round and full, the chest broad and open, and the couples short.

As the breadth of the body is not, like its height, taxable by the statute,* the buyer should avail himself of the legal omission on this point, and take all the latitude allowed; if the limbs be strong in proportion, the breadth and weight of the body cannot be too great. If, on the contrary, the pony be wanted for activity and easy labour, its symmetrical proportions must be attended to, which are pretty nearly those, in miniature, of a handsome, well-bred horse: but, in all cases, a compact, well-limbed pony is the most serviceable sort,—a loosely-made, long-legged, cat-hammed one is bad for any purpose.

Quantity and cost of Food.

We have now to consider a matter of very practical moment, viz., the quantity and cost (at the present rates) of food necessary for a pony twelve hands high.

* It is to be noticed that this was written before the alteration of the law.

Supposing it to be fed entirely on hay and oats, I think that two-thirds of the Government allowance for cavalry horses is sufficient for a pony of the above size. That allowance is, I believe, 12 lb. of hay, 12 lb. of oats, and 6 lb. of straw, for twenty-four hours. The cavalry horses generally are in excellent condition on this allowance, and I may infer, that 8 lb. of oats and 8 lb. of hay are sufficient for the stomach of a little pony. The regularity of feeding hours, and the frequency of wisping and brushing them, have no doubt a considerable influence on the condition of cavalry horses, but a pony may be at least as regularly and as well groomed, and in most cases as regularly fed.

Supposing a pony, then, to consume 8 lb. of oats per day, at the rate of 18*s.* per quarter, and 8 lb. of hay per day, at £3 per ton, the amount would stand thus—

Oats, 9 qrs. 1 bushel (of 40 lb.) at 18*s.* per quarter	£8	4	3
Hay, 26 cwt. at 3*s.* per cwt.	3	18	0
Add for shoeing	1	10	0
	£13	12	3

Straw, for litter, will generally be provided in exchange for the manure which it produces.

But a change of food is desirable, and in some instances, decidedly economical; for instance, during three winter months, furze shoots may occasionally be substituted for hay, and this would effect some saving.

Again, if straw (cut into chaff) be given instead of hay, a reduction in the above estimate will be effected; but though good straw is better than bad hay, it is to be remembered that no straw is equal to good hay. If carrots, Swedish turnips, &c., be procurable at the prices at which they are now valued by farmers, and used partly instead of oats and hay, there may be another reduction obtained in the first estimate. If lucern, vetches, clover,

or even ordinary soiling, be purchased (or grown by the owner of the pony), at the average rate of 1*s.* per pole, there will be a very considerable saving obtained during four months of the year. Calculating that a pole of such green food would be sufficient for the keep of a pony during six days, the cost would be 2*d.* a day, or about 17*s.* for one-third of the year—oats being unnecessary during that period. If, then, 17*s.* be entered for four months, instead of the sum estimated for hay and oats during that time, the actual cost of food might be reduced to £10, without taking into consideration the still further reductions that may be effected by substituting furze and straw for hay.

If a jobber have the privilege of grazing a pony on a common, he will act judiciously in not availing himself of it in the early spring, or in winter: the sour weak food which commons in general yield, renders any kind of horse unfit for work.

There is, however, an advantage which the poor man may sometimes derive from the commons in winter for his pony. He may shear the young shoots of gorse growing there; and these, when pounded in a trough, become an excellent substitute for hay or chaff—if oats be given also—until the blossoming season, when gorse becomes unfit food.

THE MULE.

CHAPTER III.

Mule and Jennet defined—Foreign mules—Temper of mules—Good qualities of the jennet—How to obtain good mules and jennets.

THE mule is the offspring of the male ass and the mare, or of the horse and the she-ass. In the latter case the produce is called a jennet for distinction, but it is properly a mule.

Mules among animals, and hybrids among plants, being in each instance generated by the intermingling of distinct species, so very rarely breed, that they are considered as barren. This order of Providence is to prevent the multiplication of endless and confused varieties, which otherwise would come into existence: "God made the beast of the earth after his kind, and cattle *after their kind*, and everything that creepeth upon the earth *after his kind*."

Mules were thought fit animals to bear princes in the days of the Jewish kings: David commanded Solomon "to ride upon his own mule," when the latter was about to be anointed king.

Foreign Mules.

Very fine mules were brought into England from Italy in former times, when prelates of the Church of Rome came over and wished to ride the easy-going and

safe animals to which they had been accustomed in their own land.

The luxurious in riding, who like what is smooth in gait and secure in foot, have always found the movements of a trained mule pleasurable.

Usefulness of Mules.

In mountainous countries, or wherever cart-roads are wanting, the mule is especially valuable for carrying pack-loads. In the neighbourhoods of the Alps and Pyrenees, very large and fine mules are kept for the purpose of carrying ladies and gentlemen up and down the long, high, and dangerous passes which the horse could not safely travel over; and they seldom or never miss their footing, unless completely broken down by extreme old age and hard usage.

The burners and hawkers of charcoal in the west of France convey great quantities of it to very distant places on the backs of these strong and hardy animals, and they are used for similar purposes commonly in Spain and other countries.

In the late Crimean war, great numbers of very fine mules were purchased for conveying the military stores of the allied armies, and they often bore hardships of various kinds under which the nobler horse perished.

Temper of Mules.

Mules, unfortunately for themselves, have the reputation of being vicious and treacherous, and are treated accordingly. To this treatment, no doubt, much of their ill-conduct is due; they are often rendered very dangerous by a system of management which leads them to lift up their heels against their oppressors. We mismanage them when young, encourage them in their tendencies to tricks or stubbornness, as the donkey is so often

taught to be obstinate, and then we complain of the results, though occasioned by our own folly.

On the continent, mules are not often vicious; they are, on the contrary, tractable.

Yet the natural disposition of the mule is very inferior to that of the horse; it has neither the docility of the horse, nor the capability of attachment to its master which the horse so frequently evinces.

A man who has children about him would not act prudently in keeping a mule, unless one of very tried character and habits; but there are many cases in which the hardihood and strength of a mule, which is more easily kept in good condition than a horse, render it the preferable animal.

Good Qualities of the Jennet.

A good jennet is far preferable to a pony for slow car work; though much smaller than a mule of average size, it is more capable of labour than a pony of small size, and much more durable. Besides, it has much of the disposition of the parent horse, combined with the constitutional vigour and patient temper of the healthy, long-lived ass. The owner of a large and good she-ass does not act wisely in breeding ass-foals from her; he would find it much more beneficial to rear jennets, whether for his own use or for sale. The value of the latter, at three years old, would be at least ten times greater than that of the former.

How to obtain good Mules and Jennets.

To obtain large and handsome mules, the mare should be of a large breed, well-proportioned, with rather small limbs, a moderate sized head, and a good forehand; and the ass should be of the large Spanish breed.

To obtain the best jennets, the ass should be very

large, strong, and good in draught; and the horse small, compact, and yet of active form.

The natural age of the mule is double that of the horse. With kind treatment in all respects, he ought to live forty years. But in very advanced life, when the teeth decay, as in the instance of the horse, soft food should be given to him in very liberal proportions.

THE ASS.

CHAPTER IV.

Description of asses in the East—Kentucky ass—The ass and pony compared—Hard treatment of the ass—Its intelligence—Origin of the ass in England—The colonel's donkey—Breeding and feeding of s

WHAT an ass that fellow is! With the word ass are associated the ideas of extreme stupidity, folly, and obstinacy; yet these qualities, however justly they may apply to many two-legged creatures, are very unfairly attributed to that four-legged species of the horse genus distinguished by the learned as *equus asinus*, or horse-ass.

Description of Asses in the East.

This despised and ill-used drudge was first introduced into our part of the world from Asia, where, in its state of freedom, it is by no means an insignificant animal. We read in the book of Job (xxxix. 7.) of the ass as disregarding "the crying of the driver;" and as to their swiftness in the East, in their wild state, we are informed by travellers, that the best horses cannot equal them in speed; indeed, their Hebrew name expresses this quality. A prophet indicates the acuteness of their perceptions, where he describes them as "snuffing the wind like dragons."* We know from Scripture history that men of rank used to ride upon asses. The thirty

* Jeremiah xiv.

sons of Jair, one of the judges of Israel, rode upon thirty ass colts when they went to administer justice in the cities over which they judicially presided; and another judge, we are told, sent out forty sons and thirty nephews on "three score and ten ass colts," as it was not until the time of the warlike kings of Israel that chariots and horses superseded the use of the ass. What would be thought now if our judges, or even our lawyers' clerks, were to travel on circuit, from town to town, mounted on asses? However, if we had never seen horses, we should probably think asses beautiful and excellent; but the superior beauty, strength, and fleetness of the horse and of the mule (which is also superior to the ass) have rendered the ass unfashionable. "The comparison degrades him; he is considered, not in himself, but relating to the horse; we forget that he is an ass, that he has all the qualities of his nature, all the gifts annexed to his species, and think only on the figure and qualities of the horse which are wanting in him, and which it would be improper for him to have."

The breed of asses common in the East, has always been larger and stronger than the degenerate kind which we possess. There is no reason to doubt that the account given of them by Dr. Russell, a physician residing at Aleppo in the last century, is correct at the present day:—"Those intended for the saddle bear a high price; they are tall, delicately-limbed, go swiftly in an easy pace or gallop, and are very sure-footed; they are fed and dressed with the same care as horses. The bridles are ornamented with fringe and cornices, or small shells; and the saddle, which is broad and easy, is covered with a fine carpet." Another writer says of the Arabian ass:—"White asses are esteemed for their rarity, and only obtainable by persons of wealth and distinction, as we conjecture from this passage of Zechariah: 'Speak ye that ride on white asses, ye that sit in judgment.'" White asses are still very rare.

THE GOAT

THE ASS

A Kentucky Ass.

The Americans have taken great pains to propagate a fine breed of asses. Captain Marryat saw splendid asses in Kentucky, of which some were fifteen and sixteen hands high. These had been obtained by crossing the Spanish breed with the Maltese. He has related as facts that a celebrated jack, called "Warrior," was sold in Kentucky for £1,000; that £600 was asked for a two-year-old jack, and £250 refused for a yearling female. It is no wonder then that this distinguished author should have informed us that "never in his life before had he felt so much respect for donkeys."

Why should not the donkey be as much an object of consideration in our United Kingdom as in Kentucky? Whatever is worth having, is worth having good. Horses, cattle, sheep, swine, and even poultry, have been brought, in this country, to a great degree of perfection, by careful crossing and judicious management: our original cow was a little animal, yet in some varieties of the tribe, she is gigantic in her proportions, and excellent in all her qualities: our breeds of the hog tribe have been rendered beautiful, by contrast with the frightful, ill-shaped swine of Belgium and France, which shows what may be accomplished in the improvement of any domestic animals by human care. Though the ass, in our moist and gloomy climate, might never equal in vivacity and intelligence its foreign relatives of more sunny climates, it might be wonderfully improved both in size and strength. The asses first imported from Spain into Kentucky did not exceed fourteen hands in height, and yet their progeny became much taller.

But, it may be asked, is an ass worth all this care and consideration? Is not a pony a much more desirable and useful animal? Is it not swifter, stronger, more docile, better calculated for cottage, farm, or garden labour than the sluggish donkey? True—to those who

can afford to pay the higher price of a pony, and support the greater expense of its keep, this animal is by far the more desirable of the two in many cases: yet, under certain circumstances, the donkey is preferable; it is less liable to sickness and is much longer-lived, under ordinary treatment, than the pony, and it may be purchased for the merest trifle—for what a poor man may afford without difficulty. It is more useful for many purposes than the pony; for instance, a donkey is more safe for carrying children or invalids on its back, as it neither stumbles nor is disposed to run away. Ponies could not endure the daily labour and scanty fare to which donkeys are subjected, whether in drawing the poor man's load from place to place, or bearing on its back heavy ladies, or panniers full of children, in their summer excursions at spas and bathing places. Their patient endurance under many privations, while it renders them objects of compassion, shows their capability of usefulness.

A donkey of my acquaintance has been drawing from a village to a market town, three miles distant, every day and back again (Sundays excepted) during many years, a large, covered market-cart. This animal, now about twenty years old, is left standing in the streets of the town to which it daily goes, without even the protection of an old sack thrown over its loins, when a storm of rain or hail is beating pitilessly upon it. A benevolent lady allows the owner of this hard-worked animal to turn it into her straw yard on its return home in the evening, and its crib is not, I believe, without hay too, supplied by her; but as to oats, carrots, potatoes, or any of these unusual dainties which an ass is not without the capability of enjoying, they are never bestowed on this particular ass as a reward for its labour. I doubt if even a thistle, which any ass would consider a luxury, is ever culled for this ass by the boy who shares its daily companionship. Yet this long-eared drudge, who, while under the cart, cannot be persuaded to move, except at

a solemn and care-worn pace, is no sooner freed from the vehicle, and mounted by the boy, than he kicks up his heels—after an uncouth fashion of his own—and canters away briskly to the farm-yard, where his dinner and supper (in one meal) await him. Perhaps, however, another motive than that of hunger tends to make him move so quickly: a crowd of urchins is generally at his heels, pursuing him and his rider with shouts, in the hope that the latter may be flung, in which they are always disappointed. Now, this is the sort of treatment which nine asses out of ten receive: boys, who are naturally inclined to cruelty and the exercise of a tyrannical temper over the brutes formed for our use—but not to be abused by us—take especial pleasure in tormenting the patient, but yet intelligent and lively ass, who, if not heart-broken by oppression, quickly learns tricks in his own defence. I once possessed an excellent donkey of great sagacity. He quietly drew a cart under the guidance of any boy, but no one could ride him except one lad, who had taught him to throw every other individual who might mount him for sport or experiment. This ass would quietly let any one get on his back, but the person was no sooner seated, than he was tumbled over the head of the donkey, who had the trick of putting his nose on the ground and lifting up his hind part, so that it was impossible for the rider to avoid being thrown; yet he never played this trick upon his teacher, showing in this a good deal of intelligence. The ass, in truth, possesses much instinct and sagacity. If at liberty, to show the acuteness of his senses, he seeks shelter at the approach of rain; he shakes and waves his ears, and by a restlessness of body, shows that a change in the atmosphere of an unpleasant nature to his feelings is occurring—and the old adage—

"'Tis time to cock your hay or corn
When the old donkey blows his horn,"

is no doubt founded on experience. Has a donkey no

sensibilities? does he not cringe when he sees the cudgel raised to strike him, as if knowing the uselessness of resistance, he neither kicks nor bites.? He is naturally docile and playful in his temper with those who treat him kindly, though from bad management he is apparently obstinate. His training is different from that of other beasts of burden; instead of being taught gradually to carry a weight on his back, or draw a cart, he is started off at once with a boy on his back, armed with a cudgel, who tugs at the bridle—rudely forced between the jaws of the little animal—as if he knew the use of it instinctively, or forced between the shafts of a car, which he is expected to draw as kindly as if he were used to it: if he does not move on, he is cudgelled for not knowing what to do, under circumstances quite new to him. Instead of blows on the neck, or head, or ears which are particularly sensitive, he often receives, as a variety of annoyance, kicks on his ribs: and it is needless to say that either system of punishment is as injudicious as it is cruel; the ass is rendered obstinate by it. If men and boys would consider how differently treated they had been in their days of inexperience, they would not be so unjust and unreasonable as to expect that a donkey should, in training, be treated so differently from a horse—merely because he has had the misfortune to be born a donkey. They, like true bullies, take liberties with this unresisting animal which they would not, under similar circumstances, venture to take with a horse or mule. The donkey really deserves to be a pet, as he sometimes is with benevolent persons.

I knew a very old French gentleman who had been one of the survivors of the army which accompanied Napoleon to Russia. In his old age, instead of keeping a prancing charger, he chose to ride a donkey. I sometimes watched this aged colonel—such was his rank—as he pruned the vines and other wall-fruit trees in his garden: now and then he would go up to a sleek happy-looking donkey—for which there was a nice pad-

dock and a stable, and pat it on the back, in a manner which showed that there was a delightful understanding between them. The old gentleman would often exchange his white cotton nightcap and garden jacket for a hat and coat, and ride Neddy—I am wrong, Napoleon we called him—to a farm which he possessed about three miles distant. That was a happy donkey, for though he had frequently to carry a heavy man a few miles, he had nothing else to do—and was always well-fed and groomed. It was, indeed, pleasant to see Napoleon, when disencumbered of the saddle, roll himself on the gravelled yard, not as if he was weary or wanted to relieve himself from any irritation of skin, or meant to reproach his master for not using curry-comb and brush, but simply from excess of happiness.

A few practical remarks will be sufficient as to the economy of keeping an ass under circumstances which render a pony less desirable.

The ass breeds at two years old, and if care be taken to procure a large description of male and female, there is no good reason why any person, having a few acres of land, might not annually breed some asses, which would sell for a price much above the ordinary one of the diminutive creature we usually see. The cottage farmer can always hire out a she-ass, when giving milk, to some invalid, who would willingly pay for the milk which is so highly prized for its sanitary qualities. It is hard to estimate correctly the expense of feeding an ass; but doubtless much less than half the cost of keeping a pony —on the economical system suggested in the chapter on pony-keeping—would be sufficient. Pounded furze, before the blossoms appear, are excellent for donkeys, and a large carrot or two daily would be one of its greatest luxuries. But in this respect, any of the ordinary garden roots are excellent; fresh chopped straw would answer as fodder, if hay were scarce, except for an ass yielding milk, when every kind of succulent food should be given, as it is to her unwise and cruel not to

feed an animal while giving milk and rearing a young one, on such food as tends to the secretion of milk, and to the maintenance of her bodily strength. Thistles and various weeds are always agreeable to the ass, and can be obtained for the trouble of collecting them. No animal is more cleanly in its habits than the ass; it must have clear water, which it sips very delicately, never putting the nose, like a thirsty horse, into the water, though the reason of this peculiarity is not very rationally accounted for by the supposition that it is afraid of the shadow of its long ears in the water.

It is to be wished that a large race of donkeys were bred, instead of the small ones which may be purchased for twenty or thirty shillings. In such case, the owners would probably treat them better than they do at present. A hawker or pedlar has not a sufficiently strong motive of self-interest for taking care of an animal which he knows he can replace for a very trifling sum. If a donkey were worth £3 or £4, instead of £1 or £2 at the utmost, we should have expectations of its being better fed,—and less abused in every way, and of living out its natural period of thirty years—whether in the labours of a cottage farm, the service of a pedlar or hawker, or in any other sort of constant labour.

COW-KEEPING.

CHAPTER V.

Cow-keeping—What breed desirable—Management—Rearing of the calf—Feeding—Treatment of the cow when confined in the house—Milking—Churning and butter making—The dairy-room—Curd and clouted cream—Cheese making—American cheese—German cheese.

WHAT is the best breed for dairy purposes? is a question which suggests itself at the commencement of our subject. No positive and direct reply can be given to it, because local circumstances, as to the qualities of pasturage, the climate, shelter, the means available for house-feeding, and the amount of money which the purchaser of a cow may have at his disposal, must determine the question. As to the last point, it is evident that one man may be able to buy a first-rate cow at a high price, while another can only afford to pay a very small sum for what must be in this case an inferior animal.

Where sufficiency of food can be supplied, whether in house or in pasture, the Durham, or short-horn breed, is probably the best that can be named, as it fully combines in itself all those qualities that are desirable in a cow for dairy purposes and for the shambles afterwards. This breed comes into profit, too, at a very early age, and is remarkably gentle.

The Ayrshire, Hereford, Devon, and Suffolk, have their high pretensions also, and deservedly.

The Jersey, or Alderney, as the same breed is also called, is excellent for giving milk; but being a native of

a milder climate than ours, it is not suited to the northern parts of our islands, unless warmly housed during the greater part of the year.

For elevated situations and free pasturage, the improved Kerry and the Kyloe are to be recommended. Of foreign breeds, the Dutch are celebrated for giving abundant milk.

The good points of a milch cow are understood by every judge of dairy cattle; and cows, whose portraits would be ugly, are often the best for profit. A lady, who manages her dairy admirably, in the north of Ireland, informs me, in her agreeable manner, that she has "one dear, ugly, old Irish cow, who gives beautiful rich milk and plenty of butter; and that her seven kine, though they cannot boast of higher lineage than that of being third for fourth cousins of a respectable Ayrshire race, produce more milk than some of the most aristocratic cows in her neighbourhood."

Management.

The proper treatment of a cow is of more consequence than her ancestry and appearance (though these are important considerations also); and the adage, "handsome is that handsome does," is as applicable to a cow as to a human being. The plain-looking cow who gives much and rich milk, and is gentle under the milker's hand, is surely preferable to the beauty who yields a lesser quantity, and will possibly, in a capricious mood, kick the pail, and spill the milk which has been drawn from her by a milkmaid in fear and trembling. A good cow is a fortune to a poor person; but the best may be spoiled by mismanagement.

I shall begin with the treatment of a cow from the time of her calving. Immediately afterwards, a warm bran mash, or a drink of oatmeal and water, should be given to her, and during three or four days this should be slightly warmed; after her recovery, one oil-cake a

day will be good for her, especially if there be a want of rich, succulent, green food.

Swelled teats are often troublesome: these may be reduced by frequent rubbing with a hot fomentation of bran and water, and if they should become chapped, from the influences of the weather or other causes, they should be gently touched with Florence oil, elder ointment, or any mild unctuous matter.

Rearing of the Calf.

The calf, if it is to be reared and not *vealed*, should be allowed to suck the cow for the first two days only: it must be immediately taught to drink new milk from the pail, as the early separation of the mother and her offspring prevents the former from becoming restless or unwilling to yield her milk to the hand.

Every dairy-maid knows how to make a calf drink by wetting a finger in the milk, and putting it into the calf's mouth, which she at the same time plunges into the pail. The calf will very soon learn to drink without sucking even a wisp of hay, which is sometimes substituted for a finger.

By measuring the quantity of milk which a calf gets, there can be no mistake as to the allowance of nourishment it receives. For the first week, a calf of average size will require a full quart of new milk, morning and evening; double that allowance in the second week, and four quarts every morning and evening in the third week; then three pints of warm oatmeal gruel at each time of feeding may be put into cold skim-milk, and gradually the warmth should be diminished until the drink may be given quite cold. At ten weeks' old, the allowance of gruel may be stopped, and the milk reduced nearly to water (which will be the better for having fresh hay boiled in it), for the calf will then begin to eat bran; and at fourteen weeks' old, it will pick tender green food.

Calves are often reared with less milk than is here stated to be necessary; but it is no true economy to stint them in their food, for no animal, ill-nourished in its early days, becomes large and vigorous; if the calf be of a large or valuable breed, it would be more decidedly "penny wise and pound foolish" to do so.

By the method above recommended, and for which Mr. Cramp, of Lewes, obtained a medal from the Board of Agriculture, there is no reduction of butter, except a little for the first three weeks.

Mr. Cramp gives a sufficient reason for not allowing the calf to run with the cow; "by doing so, she is totally spoiled for milk that season; for she cannot be regularly milked, and what the calf does not suck must dry away and cause a contraction in the udder, which may ever afterwards be an injury, especially if it be the first calf. In this case, every care ought to be taken to draw the milk in order to expand the udder; for want of which, many a valuble cow is spoiled for the dairy, and can never afterwards be made what she would have been if proper attention had been given at first.

Feeding.

The milch cow should be always well fed, but not with very fattening food. If she be limited in her food before calving, and allowed to become thin, the full-feeding afterwards must repair the waste which her body has undergone before it goes to form the milk secretions.

The feeding of a milch cow throughout the year, if economy be regarded, should be in house. It is an admitted fact, that one acre under roots and artificial grasses will go as far as three in pasture. Persons to whom economy is indifferent, and who have sweet pasture for a cow, will certainly obtain from her, on that pasture, milk and butter of better flavour throughout the grazing season, than if she were fed on artifical food and confined; she, too, will enjoy a happier life, ruminating

(chewing the cud) under the shade of a spreading tree; but if three cows can be kept by the latter system instead of one—more especially on a small piece of land—economy and common sense demand their confinement. Besides, cows at pasture frequently feed on weeds, such as crow's-foot, or on the leaves of the ash-tree, which impart a detestable taste to milk and butter.

If, however, milch cows be kept at grass, it is a good plan to allow them constantly a little fresh soft hay, which prevents scouring, especially at an early period of the season; and if they be confined and fed on succulent artificial grasses, some hay may be occasionally necessary to prevent the purgative effects of the green food. The average weight of vetches, clover, and such green food for a cow, is about eighty pounds per day.

From the 1st of May to the 1st of November, she should be fed upon various successions of green food, and the more varied the better. When the grasses have been mown for the last time and consumed, the fresh leaves of cattle-beet and cabbage (the latter in small quantities, lest they should flavour the milk) will supply her with food until root crops are ready for use. These are given with most advantage, either steamed or boiled, or at least scalded with hot water, and chopped up and mixed with chaff, bran, or meal, and always with a sprinkling of salt, which promotes digestion. Though fresh wheaten or oaten straw is good for cows in winter, when they are dry, if accompanied with Swedish turnips or some other nutritious food in moderate quantities, it is not to be recommended for a cow when giving milk; she should then have sweet and tender hay.

The quantity of roots given daily to a milch cow, from November to May, may be stated at 42lb. of mangolds, 60lb. of Swedish turnips, or 28lb. of potatoes per day. When roots are given to a cow in their raw state, they should be cut into thin slices, as angular pieces occasion the danger of choking. To guard against such an acci-

dent, a rope, bound round with leather to stiffen it, should be in the cow-house, to be passed down the throat in case of an obstruction; or, if this be not at hand, a flexible whip-handle may be used.

Green clover or tares are apt, when taken greedily, to cause cows to be blown or *hoven*, one of the most dangerous things that can happen,—it is soon known by the swelling of the stomach and the uneasiness of the animal. Immediate measures of relief must be adopted: a table spoonful of hartshorn in water will probably dispel the fixed air: if not, it will be necessary for a skilful person to let out the fixed air from the stomach, by introducing the point of a penknife: if no person be at hand to do this, the cow should be kept moving until assistance comes, and not suffered to lie down, for, from that state she would probably never rise again.

But "prevention is better than remedy;" it is wiser to guard against the entrance of fixed air into the cow's stomach than to depend upon any means for letting it out; therefore, clover and lucern, and such like food, should be cut some hours before it is used, in order to let the air escape, and it should be given in small quantities at a time,—indeed, food of any succulent kind should be supplied in very moderate quantities, and with intervals of two hours between each time of feeding.

Treatment of the Cow when confined in house.

A cow, in confinement, requires much hand-rubbing, to keep her skin in a healthy state and prevent the annoying irritation in it, which, without such care, she would suffer from high feeding and want of open air and exercise; she should, therefore, be curried and brushed. This grooming will have the best effects on her health; indeed, if it were only for appearance sake, this attention to cleanliness is called for. The flanks of a cow become daily clotted with the dirt in which she almost invariably lies, especially when fed upon succulent

food, and the adhesion of this matter to her skin is abominable in itself, and disgraceful to the cow-keeper. A cutaneous heat is apt to attack well-fed, closely-confined cows, and fattening cattle particularly; but constant grooming is the best preventive of it. The animal shows its satisfaction at having its skin rubbed smartly and frequently, and the labour thus expended in promoting the circulation of her blood and assisting the old hair to give way to the new, is well repaid in the improved condition of the cow.

Milking.

The hours of milking should be very regular, and generally once in twelve hours, this time being necessary for the due secretion of the milk; some cows, however, have such a flow of milk for the first three months after calving, and more especially in the months of May, June, and July, when succulent food is abundant, as to require to be milked three times a day: the milk of such cows, however, loses in richness as it gains in quantity; but for a person who sells new milk and makes no butter, a milch cow of this kind is very valuable. If any portion of the milk of such a cow should be used for butter-making, it should be that which is milked in the morning after the night's secretion. The lady to whom reference has before been made, is in the habit of having her cows milked three times a day for the first three months after calving; and three of them yield about twenty-four quarts per day, the others about twelve or fourteen quarts, but the milk of these is exceedingly rich, and they probably are as valuable for butter-making as those that give double the quantity of milk. There are good authorities, it must be admitted, for frequent milking, provided the intervals are regular, on the supposition that frequent milking gives additional tendency to the secretion of milk, but undoubtedly the *butyraceous* quality will be deficient in milk that has not been twelve hours collecting in the udder.

As to the operation itself of milking, the late Mr. Cobbett's observations are excellent: "Cows should be milked *clean*. Not a drop, if it can be avoided, should be left in the udder. It has been proved that the half-pint which comes out *last* has twelve times, I think it is, as much butter in it as the half-pint that comes out *first*. The udder would seem to be a sort of milk-pan in which the cream is uppermost, and of course comes out last, seeing that the outlet is at the bottom. But besides this, if you do not milk clean, a cow will give less and less milk, and would become dry much sooner than she ought."

Churning and Butter-making.

Some persons churn their milk and cream together; others the cream alone. The lady who has favoured us with the details of her practice has been in the habit of churning every day, and with a produce of butter at each churning, in the proportion of nine to ten pounds from every fifteen gallons of milk, from April to October, and every other day beyond that period until towards spring.

The quantity of milk which a cow will give throughout eleven months of the year is very variable, but no cow can be considered a good one which does not give, with fair keeping, eight quarts per day. A cow should be allowed to go dry from six weeks to about a month before calving; whenever the milk has a saltish taste, it is a proof that she should be milked no longer. Where a single cow is kept, it is better to churn the cream only once a week.

When a sufficient quantity of cream is collected, it should be put into a churn of suitable size and good mechanical construction, by which the butter may be separated in a very short time from the cream. In cold weather, it is necessary to warm the churn by pouring

boiling water into it some minutes before it is used—the water, of course, is to be thrown out before either milk or cream is put in it: this is better than heating the milk itself. If the dairy be kept sufficiently warm, with a pan of clear charcoal, there will be no difficulty in the churning; but without some artificial warmth in frosty weather, cream will not yield butter except with great loss of time and labour, and both may be vain. In hot weather, on the contrary, the particles of butter, from being too soft, cannot be collected together from the cream, which it is often difficult to cool. When the churning is over, the butter should be put into cold spring-water, with a little salt in it, in order to clear it from every drop of milk, and it will require to be well worked with a wooden spoon or a clean hand.

The Dairy-Room.

It remains only to be added, that a dairy and all its utensils ought to be kept in a perfectly clean state; that it should have a cool aspect, and not communicate by a door with a sleeping-room or a kitchen, lest the milk be thereby tainted. The churn, after being used, should be scalded and exposed to the sun or air, and the cloth used for straining the milk regularly rinsed and dried.

Curd, and Clouted Cream.

Fresh curd is delicious in summer: it is prepared by mixing a little rennet with cream or milk, which causes them to curdle. Cream produces the more luxurious curd, but milk-curd, which is more common and economical, is also, when eaten with sugar and milk, or cream, a great delicacy.

The Devonshire clouted cream is remarkably good for the tea-table, and for making butter. What is called clouting is effected in the following manner:—Put ten

or twelve quarts of new milk, which has stood twelve hours in the cooler, into a tin or earthen pan, placed on an iron plate heated gently by a furnace, or over a stove, on which it should remain until the cream has completely risen; when the milk under the cream shows symptoms of boiling, remove the pan to a cool place; skim the new clouted cream when quite cold, and put it into a churn or a wide open vessel, in which it can be stirred by a stick, having a wide blade at bottom. By thus working the above quantity of cream, ten or twelve pounds of the best butter will be obtained in a much shorter time than if the cream were some days gathering.

Cheese-making.

This is with many cow-keepers a part of regular dairy work; but so much depends on the qualities of the pasturage, or food of whatever kind on which cows are nourished, on the number of cows kept, the temperature, season of the year, condition of the dairy and all its utensils, that it is difficult to describe accurately all the details of management by which the different cheeses are made. Nor is it necessary; the actual process of cheese-making in all cases is conducted nearly on the same principles. As a general distinction, it may be stated that the very rich cheeses of the first quality are made with the morning new milk, mixed with the cream of the preceding evening. The inferior cheeses are made of skim-milk; and as those of the higher qualities are more or less rich according to the proportion of cream added to the new milk, so are the skim-milk cheeses more or less poor, hard, innutritious and indigestible, as the cream may be more or less completely removed.

Making Rennet.

Before the process of cheese-making can be commenced, rennet must be provided. This well-known substance is

contained in the stomachs of milk-fed lambs and calves; the latter are, however, the usual sources of the supply, and the curdling acid contained in either is better than any vegetable or mineral acid, because it does not impart an unpleasant flavour to the curd or cheese.

It may not be amiss to state, that the English and Scotch methods of treating the stomach and its contents are somewhat different. The English method is to take the rennet out of the stomach, wash and scrape this, and then replace in it the rennet, after it has been well washed, wiped dry, and sprinkled with salt; the curdled milk and chyle are washed away, and the stomach and rennet alone are retained. Mr. Aiten, who is a high authority on the subject, alluding to this difference, says: "So far from throwing aside the curdled milk found in the stomach of a calf when killed, or washing away the chyle, both are in Scotland carefully preserved, and are found to tend much to strengthen and enrich the rennet. The curdled milk and chyle in the stomach of the calf form more powerful rennet than can be drawn from the bag alone when these substances are removed. It is the chyle formed from the rennet, or gastric juice mixed with the food in the stomach of the animal, that forms the coagulating power; and it is only from that chyle so formed in the stomach that the bag becomes impregnated with coagulable matter more than any other of the intestines of the animal." Scotch rennet will do its work in a few minutes, whereas rennet preserved on the English plan may require two or three hours to curdle the milk, and a much smaller quantity also of the former will suffice, a table-spoonful of the best Scotch rennet being sufficient to coagulate thirty gallons of milk.*

The milk being of blood-heat and strained into a fit vessel, a sufficient portion of rennet is to be mixed through it: if the milk be too cool, it must be raised to the above temperature by putting a little hot water into it, and

* Rural Cyclopædia.

while curdling, let it be covered with a cloth. In about twenty minutes the curd will be formed; then slit it in various directions with a knife to let the whey separate easily from the curd, and skim the whey off continually as it rises. When the curd is as solid as butter, remove it—without breaking it, if possible—into a sieve made for the purpose, or any vessel suitable for draining, and (with a cloth tied over it) press the curd at intervals of time gently and gradually with a weight, in order to free it from the remaining whey. The curd should then be cut up into little pieces with a cheese-knife (which is an implement of peculiar construction), thoroughly salted, and then put into a cheese-vat, or mould, pierced with holes at the sides and bottom, and pressed heavily, three hours at a time every twelve hours (the cloths being regularly changed), until every drop of milk has oozed away, and the cheese is completely consolidated. The after-management consists in sprinkling salt over the cheese and keeping it dry, clean, and in a warm place until it is sufficiently hardened.

As to the colouring substances, such as annatto or grated carrot, used for giving a yellow hue to the cheese, they are useless at best: some of the stuff used for lacquering the outside is decidedly noxious.

The only difference in the manufacture of new milk and skim-milk cheeses is, that the latter require less care. It is satisfactory to know that the keeper of a single cow may make good cheese on a small scale.

A cream cheese, fresh and well made, is a real luxury. The best way of making one is to put the cream in a cloth into a small flat mould, from which the milky matter may drain off. With leaves or rushes over it, it can be turned over and pressed with the hands through the cloth without being touched by them. The temperature in which it is kept should be as much as possible uniform. A cream cheese may be made in a very short time, as follows:—To a pint of cream (warmed) add a little rennet; after it has stood for an hour, put it into a sieve with a

cloth laid under it. After twenty-four hours transfer it to a suitable mould, and cover it with a wet napkin, on which a board is to be moderately pressed. The rennet ripens the cheese for eating the second day.

American Cheese.

The following is an American recipe for a butter-milk cheese:—"The contents (butter-milk) of my churn," says the writer, "I put into a pot, which I hung over a slow fire. The butter-milk curdled, and the curds sank to the bottom of the pot. I then poured off the whey, and worked the curd as I would other cheese, giving salt to the taste, which was about half the quantity given to skim-milk curd. The curd was then put into a clean coarse cloth, tied tight, and hung from the ceiling to dry for a few weeks, when the cheese was fit for use. If a bit of butter be worked into the curd, and the cheese kept for three or four months, it will then be very good." *

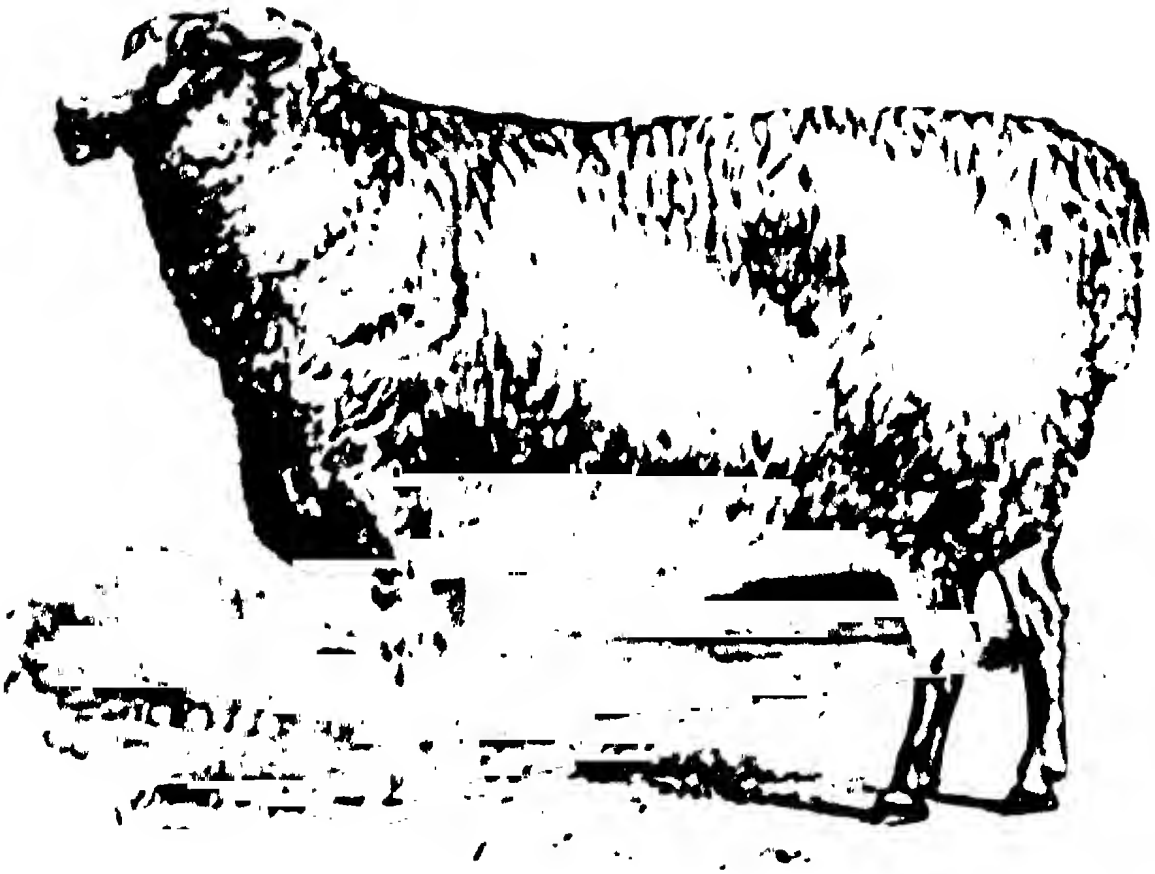
German Cheese.

Some of the Germans use potatoes in cheese-making. The process is described in the same periodical, from which I take the following abridged report of it:—

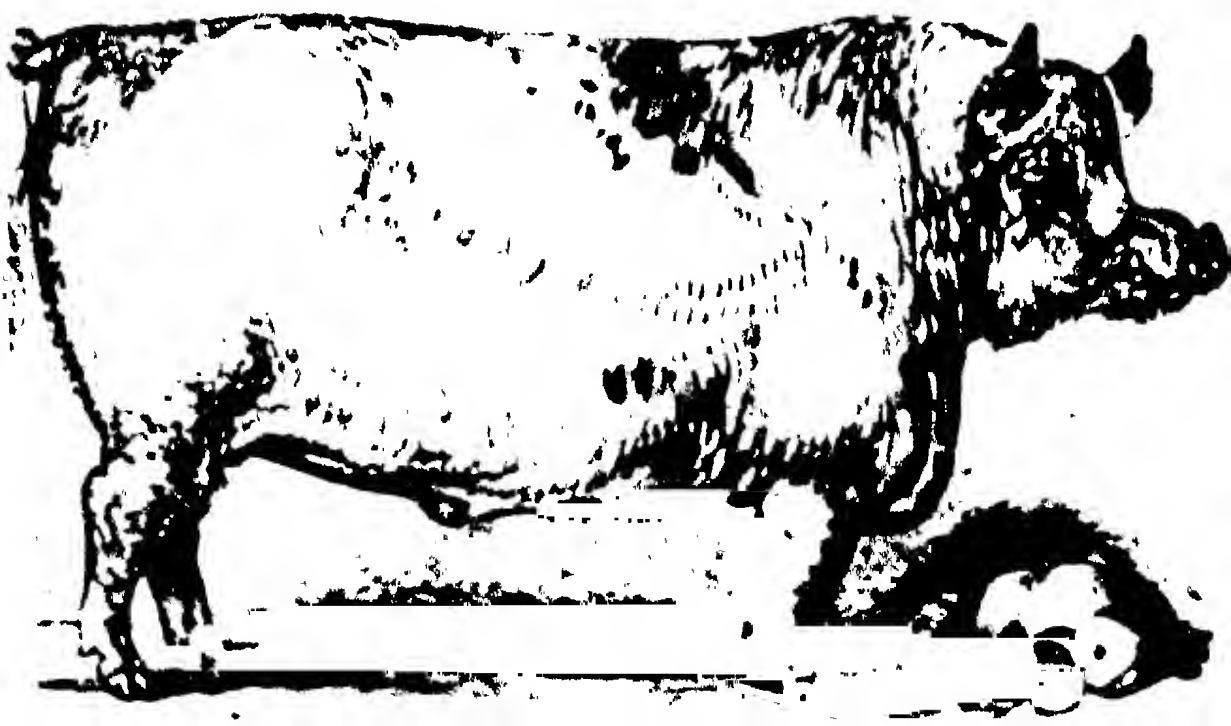
"When a sufficient quantity of mealy potatoes has been boiled and become cool, peel them, and reduce them to a pulp by bruising. To five pounds of this pulp add a pound of sour milk and some salt; knead the mass perfectly, then cover it, and let it stand three or four days, according to the temperature of the weather; then knead it again, and put it into a sieve to drain thoroughly; let it be dried in the shade; finally put it in layers into a crock, in which it is to remain fifteen days: it will then be eatable, though its quality will improve with age.

* Quarterly Journal of Agriculture.

Potato cheeses, if kept in a dry place, and perfectly excluded from air, will, it is said, keep fresh for many years. These cheeses have the peculiar advantage of not becoming worm-eaten. The proportions may be varied: for instance, two parts of curdled milk may be put to four parts of potatoes, or four parts of milk to two parts of potatoes. The housekeeper may make her own trials of these."



SHEEP.



THE SHEEP.

CHAPTER VI.

Character of the sheep—Improved Leicester or Dishley—Southdowns—Cheviots—Blackfaced—Age—Gestation.—Management of the lambs—Cure for the scour in lambs.

The sheep is one of the gentlest of the animals which God has created for the food and clothing of man. This creature is useful to us in various ways. Its flesh feeds us; its milk produces cheese; its fat, besides the uses in cookery, supplies us with candles and ointments, and materials for soap; its wool clothes us, and serves for bedding, carpeting, and other articles of furniture, and affords employment to multitudes of men, women, and children, in various trades, and amusement to ladies who delight in knitting, netting, and rug-work. So important are the uses to which the fleecy covering of a sheep is convertible, that the Drapers' Company originally intended to adopt this motto:—"No ram, no lamb; no sheep, no wool; no wool, no woolman; no woolman, no spinner; no spinner, no weaver; no weaver, no cloth; no cloth, no clothier; no clothier, no cloth-worker, fuller, tucker, shearman, or draper." The milk and cheese of sheep constitute in many countries a chief article of human food. Even the horns, which in some varieties are common to both sexes, are useful to the button-maker; glue is extracted from the trotters, and the skin serves for parchment, book-binding, gloves, and other purposes for which leather is useful.

In a practical and brief sketch such as this is designed to be, it is unnecessary to distinguish more than a few of

the principal varieties of the sheep reared in Great Britain, where they have been brought to greater perfection than in any other country in the world.

The improved Leicester or Dishley, which is of the long-woolled class (though their wool is shorter than that of the long-woolled sheep generally); the Southdowns and the Cheviots (short-woolled); and the Black-faced (with long coarse wool), are sufficiently distinctive for our purpose. Without particularly noticing any of the intermediate kinds and useful crosses, we may point to these as the best types from which a farmer may propagate a stock suited to every locality in the United Kingdom, from the most luxuriant pastures of Leicestershire, to the most elevated and barren mountains of Scotland and Ireland.

The Leicesters arrive early at maturity, and fatten to a great weight; and their form is beautiful to one who views them as mere living masses of mutton, and likes to feel a thick lining of fat on the ribs and shoulders and other parts. This breed, too, has an early aptitude for fattening on rich pastures (for which they are designed), and their fleeces are from five to seven inches in length of staple; but the meat is not delicately flavoured, and is frequently rejected by some butchers' customers; and as the fat is laid on the external parts, where it is often of disgusting and very uneconomical thickness, a preference is given, in all places to which the breed is suitable, to the Southdowns, which *die* better, as butchers say, having the fat more equally and more internally deposited, and less accumulated on the external parts of the shoulders and loins, &c.

Southdowns.

The Leicesters are not considered so prolific, nor such good nurses, nor as hardy and easily trained to confinement as the Southdowns. These have not such unwieldy bodies as the Leicesters, with legs dispro-

portioned to the bulky bodies which they have to support, and are active and handsome. On the chalky and gravelly soils of Sussex, in which county they have existed since the time of the Norman invasion, no sheep can thrive better; and for general purposes, in all the lowland counties of the United Kingdom, they seem to be preferable to any other kind. In Berkshire, as in Sussex, they are almost the universal breed maintained, and for general objects, there seems to be no good reason for not preserving the pure breed unmixed in that and all other districts to which they are suitable.

The Cheviots,

which have been from the earliest times bred on the Cheviot hills, in most parts of the highlands of Scotland, and many of the central and northern parts also, have been improved by the sheep breeder's care. Though they have not that depth in the breast, and breadth in the chine which the better-fed lowland sheep possess, and are inferior in carcase compared with the Leicesters (the ewes only weighing from 12 to 14 lb. a quarter, and fat wethers from 16 to 18 lb.), they are well suited for the scanty herbage and ungenial winter temperature of the hills of our northern counties. They thrive among moors and peat-mosses, and in the severest weather are left to shift for themselves, unless the depth of snow be such as to render it necessary to give them hay, or oats if the elevation of the land be so great as to render impracticable the conveyance of hay to them—turnips in such case being out of the question. As the length of their legs enables them to range about in search of the herbage on which they subsist, and their fine fleece is so close as to resist the severity of winter, they would prove a valuable stock in the mountain districts of Ireland, where they might enjoy a much more favourable temperature, and be always certain of finding a sufficiency of

pasturage, without the necessity of scraping off the snow with their feet, as they have learned to do on their native hills.

The Blackfaced,

of which breed both sexes have horns (the Cheviots are without them in either), are more suited, however, to the very high and heath-covered mountains of Scotland, as they also are to those of great elevation in Ireland, because, though inferior to the Cheviots in size, and neither arriving so early at maturity nor fattening so readily, they are a still more hardy race, and can subsist on the heath shoots which are not sufficient for the Cheviots. These highland and hill sheep, as may be supposed, are only reared on the highlands; they are sold afterwards to the lowland graziers, who feed and fatten them on good pastures, and coax them to eat turnips.

Indications of Age.

The age of a sheep is known by its teeth until it attains its fifth year, after that period there is no certainty of its age. The eight incisor front teeth of the lower jaw, with which the lamb is born, give way successively to others, which replace them year by year in pairs: thus a shearling has two new teeth in front; a two-year old, four; a three-year old, six; and a four-year old, the full set of teeth.

Gestation.

The ewe goes twenty weeks with young; and the period for lambing varies according to circumstances. It is deferred longer in the colder parts of our country, where scanty vegetation and harsh winds would be so unfavourable both to the ewes and the lambs in the earlier months of spring.

In the milder climates of the midland and southern counties, where good shelter and juicy food are provided for nursing mothers in the first months of the year, the season of lambing takes place early; and there are some breeds of sheep, the Dorsetshire for instance (which are mostly horned), that will breed at almost any time of the year, and are therefore highly valuable to farmers who desire to have lambs dropped at Michaelmas for supplying house lamb in the London markets between Christmas and the usual season.

Lambs designed for the early markets should have bruised peas or oats (the former preferable) put into a trough for them as soon as they will nibble at them, which will be at a few days old. Ewes, whether before or after lambing, should never be allowed to lose their condition. The growth and vigour of lambs that are to be kept on, are greatly promoted by early feeding; therefore they should never be stinted in their natural supply of milk, for if they are deprived of their full allowance of it before the proper time of weaning, say at twelve weeks (though in some districts they are allowed to run with the ewes until August, in order to admit of cheese-making), they will sustain a loss in vigour which cannot be compensated by the gain in cheese, or in milk which is sometimes abstracted from the use of the lamb for the more urgent purpose of feeding children of hill cottagers. The ram lambs not intended for breeding purposes, are usually incapacited from propagating their kind at the age of three weeks (at which period the tails of lambs are usually docked off), but in some cases the former important operation alluded to is deferred until the beginning of autumn, in order to promote greater size and vigour of constitution in the young animals.

Management of the Lambs.

The management of sheep varies much in different districts of the United Kingdom, according to the pecu-

larities of soil and climate. In some localities they are grazed throughout the whole year, and only fed with hay if the severity of the weather prevents them from biting the blades of grass, or where natural shelter is not available for them; and sheep so treated yield the best-flavoured mutton. A flock of handsome sheep at full liberty, in a fine park or lawn, ruminating in luxurious indolence under the shade of a widely-branching tree, is a very interesting sight; and, on the contrary, a flock huddled together, as we often see them, in a cold, wet, wintry or early spring time, is a painful exhibition of animal discomfort. In the lowlands of Scotland and the north of England especially, sheep may be seen closely penned until they have consumed every eatable mouthful, however foul and unpalateable it may have been rendered by the contamination of their own excrements, and without any shelter than that which the hurdles or a clipped and leafless hedge afford. Yet, in point of economy, the folding of sheep upon turnips during one half of the year, and on clover, tares, &c., during the other half, is far preferable to the old system of grazing at large; for it has been by this mode of management, which keeps a due proportion of every arable farm under green crops, that the soil of England has been rendered so productive, and that such profitable employment has been afforded to great numbers of our countrymen in the manufacture of wool.

There is, however, another mode of confining sheep practised by some farmers in preference to the folding system, viz., keeping them in house. As this method is quite applicable to the cottager, who should study minute economy, and who may find it more convenient to purchase a couple of sheep than a cow, and may have only food from his garden or patch of clover or tares for the former stock, I shall give a few particulars on the subject, having lately examined a sheep establishment of a peculiar kind in Hampshire.

The building is about 80 feet long and 10 feet wide

(in the clear), open in front, and containing a boarded grating laid over a bricked and cemented cavity, which receives the droppings and urine of the sheep until it may be convenient to remove this valuable mass of manure. The breadth and space allowed for every pair of sheep (which have a rack and manger to which they are fastened) is three feet, so that about fifty sheep are accommodated in the shed. Broken-mouthed ewes and wethers are the principal stock. They were brought in about the 1st of July, in pretty good condition, from sweet hill pasturage, and a short run on a field principally of white clover and trefoil; and it was expected that in four months they would be in perfect condition, weighing 30lb. a quarter. Tares or clover, with peas and oil-cake, will be their food until Swedes come in; and for the lots fattened in the winter and spring months, the following allowance of food is deemed a sufficient average allowance, even for heavy sheep:—2½lb. of hay, 2lb. of oats, 1lb. of peas, and 7lb. of turnips. There seems to be no reason why three successive lots might not be fattened annually under this management.

A cottager might, perhaps, find it as profitable to keep two or more ewes, to provide lambs for the very early markets, when he might expect from 30s. to 40s. each; and as Dorsetshire ewes have lambs occasionally twice in the year, and twins frequently, they are the best kind for his purpose. But the Southdowns, crossed with the Gloucestershire, are also to be recommended. After feeding the ewe highly with turnips, parsnips, corn, and oil-cake, when she has lambed, her condition will be easily advanced, until she is fattened off and sold. Or she may be held over, but we think less beneficially, for yielding other lambs, until she becomes broken-mouthed, and too old to be kept. A benevolent man does not like to devote his pets to the shambles until he cannot help it.

The rich ammoniacal manure obtained by the fore-

going methods is, to a little farmer (such as are numerous in Ireland), or to an English cottager with a field or good-sized garden, of exceeding value. But all things considered, if he can provide plenty of litter for the bedding of pigs, he ought to keep them in preference to sheep, should he be limited to keeping either one or the other. If he does not intend to breed lambs for the Christmas markets, and wants to obtain a suitable stock for lambing at the natural period, he should purchase ewes in lamb during the month of October. No fixed rule can be laid down for the guidance of cottagers who have land, as to the relative benefits to be obtained by keeping a cow, pigs, or sheep, for after all, the question resolves itself into one of locality and other circumstances. Where one animal is beneficial in a particular county, another may be beneficial in another; but the pig is almost indispensable to convert litter into rich manure, and to act as a save-all by consuming the offal which the other animals would reject.

Cure for the Scour in Lambs.

Mr. R. Fisher, of Alcester Lodge, states, that he has found, by three years' experience, that the bathing of lambs is the most beneficial remedy for the scour. "When the lambs are thus affected," he says, "I have them dipped for twelve mornings successively: a running stream is preferable to a pond. The lambs should be kept on old turf. My lambs have been affected from July to October. Sainfoin is the most beneficial food for them when suffering from this complaint. I have my lambs dipped at eight o'clock in the morning, and no pains are taken to dry them afterwards."

SWINE.

CHAPTER VII.

Different breeds—Superiority of the Berkshire—Character of the hog—Weaning—Food and cleanliness.

Pigs constitute an important live stock, not only to the farmer, but also to the cottager, if he be possessed of a field or garden. If he do not keep a cow, a pig is necessary to him, in order to create manure; and the rearing and fattening of pigs will be still more beneficial to him who has a cow.

The wild boar, from which all our European varieties have sprung, was formerly a native of this country, and preserved in the royal forests for the chase. Of our domesticated varieties, we are disposed to give preference to the Berkshire breed, although the Hampshire, Suffolk, and some other improved kinds have also admirable qualities. The Berkshire combines all the proportions desirable in a pig, whether it be required for pork at an early age, or for bacon of light or heavy weight. This breed is easily kept in good condition, and has an early tendency to flesh: one of this sort is recorded to have measured, from the nose to the tail, 3 yards 8 inches, to have stood 4½ feet high, and to have weighed 1,215 lb. But size, even approximating to such an enormous standard, is not characteristic of the Berkshire kind as it is of the Yorkshire and old Irish breed, so well known in a portion of the county of Kilkenny—the barony of Iverk. The gigantic hams and firkins which were prized formerly are no longer in such demand as those of small or moderate

size that the Berkshire supply, the average weight of the twelve months' old being about eight score pounds.

The true Berkshire pig is black, or black and white, short-legged, full and round in the loins, rather fine in the hair, the ears small and erect, and the snout not lengthy. This description of animal forms a striking contrast with the long-sided, convex-backed, lob-eared, long-legged shambling brute which was common in many parts of Great Britain, and almost universal in Ireland, thirty or forty years ago, and which still, without any improvement in form, is the general description of the pig throughout France and most of Germany.

In giving preference, however, to the Berkshire breed, it is not to be understood that I consider them handsome in a positive sense, or perfect models of good breeding and propriety in their habits and manners. No dumpy animal, with its belly near the ground, with four short crutches for legs, hair by no means silky, a little curled tail, and small sunk eyes, peering into every hole and corner, and never looking upwards to the glorious firmament, can be called an absolute beauty: but, comparatively with other races of swine, the Berkshire are handsome; and, as to their habits and manners, they have no little merit; for, considering the natural dispositions of the hog family, and the contemptuous manner in which they are spoken of and treated everywhere (except in certain parts of Ireland and the highlands of Scotland, where pigs are privileged orders, and experience such respect as to be permitted, and even invited, to occupy the same room with their masters, by day and night, in consideration of their paying the house-rent, and supplying the means of purchasing salt, candles, and soap), the Berkshire race have unquestionable merit, and appear to respect the decencies of life. Their females have never been known to commit infanticide, as some other domesticated tribes of swine undoubtedly do, from what we consider a depraved taste; nor have either sex of this tribe been ever justly accused, or even suspected, of that

cannibal propensity which has led individuals of certain other tribes of the great hog family to seize upon the tender babe in the cradle and devour it, "marrow, bones, and all!" They (the Berkshire) are so docile and gentle, that a little boy or girl may drive them to and from the pasture-field or the common without having their authority disputed; and, when ranging about in the happy consciousness of liberty, though they may sometimes poke their noses where their interference is not desired, they do not perpetrate half the mischief to the turf which other classes of swine are prone to commit. They seem disposed to content themselves with the grass on the surface of the soil, without uprooting it in search of delicacies that may lie beneath, as do some of the long-snouted tribes which plough the earth up in furrows. They seem to make it a point of honour, too, to become fat as fast as possible, in return for the food they have received, in order that thus they may be in condition to pay "the pound of flesh" which is "in the bond" against them. They never fret at trifles, and thereby impede their digestion, and lose health and flesh. They never sulk and refuse their meals; nor do they complain of the quality or scantiness of their food, like some of those ungrateful children, of certain parochial asylums, who have fancied that they could have eaten a little more porridge, if it had been ladled into the platter for them. I do not indeed say that the Berkshire swine are singularly neat in their personal habits, quite ceremonious at their meals, and free from the vice of gluttony, nor, that they will not scramble and fight for the best bits, and exhibit their unseemly manifestations of self-indulgence; nor that they would be shocked at snoring aloud, even in the presence of royalty or nobility, if the inclination to fall asleep should seize them: but, then, it is to be remembered that every individual of the hog species would do the same things. In short, their peculiarities decidedly tend to the benefit of mankind; and, after all, their failings, like many of our own, proceed entirely from the stomach.

The capacious paunch of the pig, and its great powers of digestion, are what render it so beneficial to us; yet though, in a domesticated state, a pig will eat almost any sort of animal or vegetable food—raw or cooked, fresh or putrid,—he is, when at large, as naturalists inform us, the most delicate and discriminating of all quadrupeds. If free to select his vegetable food, he will reject a greater number of plants than the cow, the sheep, the horse, the ass, or the goat will refuse; so nice does he become when luxuries surround him, that in the orchards of peach-trees of North America, where the hog has delicious food, it is observed by Goldsmith, "that it will reject the food that has lain but a few hours on the ground, and continue on the watch whole hours together for a fresh windfall."

Character of the Hog.

We only know the hog under an unnatural character, in which he has few opportunities of exhibiting his natural sagacity. We are acquainted with him as a gluttonous, drowsy fellow, who would as soon wallow in the dirtiest puddle as bathe in a limpid stream, and who exhibits no great sensitiveness to passing occurrences, except when a storm is rising; then, indeed, he seeks his sty in nervous agony. He appears very apprehensive of ferocious dogs, from woful experience of the sharpness of their teeth upon his ears, and evidently suffers terror when one of his companions cries either from fright or pain—as when undergoing the operation of being ringed; and therefore it appears incredible (even with Buffon's high authority on this point) that "mice have been known to burrow on the back of these animals while fattening in the sty, without their seeming to perceive it." The hog is too sagacious to be imposed upon in such a manner: an animal which is known (with careful education) to distinguish the letters of the alphabet better than some children can, and to back and stand game, cannot be so stupid as is generally considered.

At the age of eight months, the female should be allowed to receive a visit from the boar.

In selecting the female for permanently breeding, care should be taken not only that she be well-proportioned and free from defects, but also that she have not fewer than ten dugs at the least, though on the first and second occasions of her having a litter, it is very improbable that she will have ten pigs. A litter of twelve, or even more, is not uncommon, but ten is a more desirable number. The supernumeraries are weakly, and only reared by care, and with injury to the strength of the mother, and to the vigour of the other individuals of the litter.

The Creator has proved to us, by experience of His dealings, that animals domesticated by man for his own use, are to be improved in their qualities, and, if designed for his sustenance, rendered more prolific by care and judicious management; just as it is with respect to plants which are multiplied, varied, and brought to perfection by skilful culture.

In both cases (animal and vegetable) the Almighty supplies us, as it were, with the rough material, on which we are to exercise our ingenuity and industry. With respect to pigs, it is a curious fact, that in a wild or natural state, the sow has but one litter in the year; the domesticated has two, and may have five in two years. One sow has been known to produce three hundred and fifty-five young ones in twenty litters. Mr. White, the naturalist, mentions an instance of a half-bred Chinese sow which had been kept until she was seventeen years old, when she had produced about three hundred pigs, having had two litters in the year for ten years, and frequently double as many pigs as teats. The supernumeraries were destroyed. In such a very prolific breed, twelve teats may be considered among the qualifications of a sow. This breed is excellent if small porkers only are required; but it is too small for producing bacon, and altogether inferior to the Berkshire or Hampshire, and some other improved varieties. A boar (exhibited at the

Highland Society Show, in 1838) was the legitimate father of one thousand four hundred and sixty-six pigs, when he was only twenty months old.

During the period of pregnancy, the sow should be sufficiently fed, but not to excess. Experience has proved, that a sow, if fat during that time, is not prolific; but the opposite extreme—a favourite error with some ignorant people—that of stinting her in food, so that she remains meagre, is also to be avoided; a feeble progeny must be the result, if the mother be weak and unable to impart due nourishment to them during her pregnancy.

Weaning.

The sow goes four months with young; and the proper seasons for having litters are March and August. The weaning should take effect seven or eight weeks (if the litter is to be reared) after she has farrowed. If the object be to have sucking-pigs for roasting, they should not be kept more than four or five weeks with the sow; and as she will receive the boar's visit the ninth day after farrowing, three litters in the year may easily be obtained from her. If the young pigs are to be reared, it is a great matter to have them born at the two seasons of the year which have been specified, in order that they may be weaned in temperate weather, and when there is an abundance of clover, vetches, mangold wurtzel, lettuces, &c.

At six weeks old, the young ones of both sexes, not designed for breeding, should be treated accordingly; and at eight weeks they should be weaned with skim-milk and butter-milk. Young pigs thrive better, for a short time after weaning, on sweet than on sour milk; but when they are pretty well grown, the latter seems more beneficial and palatable to them: they devour grains, also, which have fermented, with more avidity than if fermentation had not taken effect. Coarse pollard, or the tailings of corn, or beans, should be given

to them after weaning, with boiled or steamed roots, along with milk or kitchen wash. A great object ought to be, to feed pigs well from the commencement; the food then tells considerably: the cost and difficulty of bringing up lost condition and size is great; and no animal thrives and attains full vigour and growth, if not well nourished in its youth. Store pigs, five or six months old, of the Berkshire, Hampshire, and some other thrifty kinds, are very beneficially kept in growing condition on raw vegetables during the summer and autumn, if on a dairy farm—milk, in some form, being highly conducive to their healthy growth. Any one who examines the clean, ruddy state of the skin of pigs partly fed on milk, will estimate the value of such diet.

There should be a separate yard and sty for the weanlings; and for swine in all stages of growth and condition, a clean dry bed is indispensable. If manure be a principal object, green food should be given to store pigs in a confined yard, in order to its increase. A great quantity of manure may be obtained, by right management, even from a single pig.

Food and Cleanliness.

If pigs are fed together, the feeding-troughs should be frequently washed, and be barred, so that each animal shall be limited to the space through which it introduces its head, otherwise the stronger will overpower, and perhaps drive away the weaker of the party altogether from the food. The bars also prevent the ill-mannered brutes from putting their dirty feet into the mess, which otherwise they will generally do.

The Berkshire pigs are fit to be killed at about five months old, for pork; at that age they weigh from two-and-a-half to three score pounds, and are delicious for the table. If put up for the last two or three weeks, they usually get a little barley-meal or fine pollard, in

addition to the ordinary food, and are not fed upon the watery diet that suits the nature of store pigs of the same age. Young pigs require a good deal of liberty, which unquestionably promotes their growth and healthiness; but unless in the farm-yard, and about the barn-door, pigs in actual process of fattening should be confined altogether, so that they may eat and sleep alternately, without any of those disturbing influences which tend to interrupt digestion.

A Berkshire pig will, at from eighteen months to two years old, attain full weight,—say, from twelve to fifteen score pounds. All pigs should have barley-meal mixed with that of peas, in order to render the flesh firm. They may be fattened also on potatoes or parsnips, with a little barley-meal. As it has been calculated that two-and-a-half poles of good parsnips are sufficient to fatten an ordinary pig, without any other food, the cottager may perceive how much it is in his power to supply himself with a flitch of bacon at a small cost. On a barley and peas-meal dietary, it is estimated that a pig will increase from nine to ten pounds in weight, when in full fattening order, for every bushel of the mixed grain. Malted barley is peculiarly beneficial in fattening swine, and raw corn, or peas, quickly harden the flesh of those designed for bacon of superior quality. It has been ascertained that milk-fed pork is not equal to that fed on barley-meal; it looks as well, and if eaten fresh, is as well tasted; but it will not stand the test of curing, for in a few months it becomes rusted, whereas the other will keep good for a year. Again, the bacon fattened on beans is too hard, and boils out, instead of plumping in the pot (to use a vernacular phrase); and such is the prejudice against the latter sort of bacon among hog-killers, that they will not buy it except at a lower price.

At the commencement of the fattening process, pigs consume much more food than subsequently; and when quite fat, very little comparatively. A pig, therefore, for mere profit and economy, should be thoroughly fattened.

A frequent washing and brushing of the skin—though not usual—is to be strongly recommended, as tending to promote cleanliness and a healthy circulation. How, indeed, can a confined brute be in health, or in a state of bodily comfort, with a skin incrusted with scurf, and various defilements?

The operation of scrubbing must be very agreeable to an animal which naturally takes pleasure in scratching itself, though it may ungraciously grumble when first subjected to the brush.

Pigs, when sick, are like many men, very intractable; but fortunately, they will generally eat, even when quite ill; therefore medicine may be administered in their food. Salts, sulphur, and antimony, are the usual specifics for their disorders, which (if they do not result from blows, wounds, or accidents) arise from starvation, or foul food, and dirty, damp beds. Measles are probably occasioned by an impure state of the blood; and strong beer, with peas-meal, has been prescribed as a tonic. If a pig refuses his food altogether, he is in a hopeless state. For imposthumes, after they have been opened and squeezed, a dressing of hog's-lard and salt is reckoned efficacious.

THE GOAT.

CHAPTER VIII.

Varieties—Wild goat—Domesticated goat—Advantages of keeping goats—Uses of.

It is a curious fact, that although the sheep and the goat are to our views so distinct in formation, naturalists have found it difficult to point out precisely the differences in their physical conformation. One breed of goats in particular (known in Wales), without horns, and white, is said to be distinguishable from the sheep only by its hairy fleece and indications of a beard. Some naturalists have distinguished goats and sheep from each other more by their tempers and dispositions, which are so manifestly opposite in some particulars, that our Saviour selected them as representatives of the good and the bad among mankind at the great final day of judgment, when God shall "separate the one from the other, as a shepherd divideth his sheep from the goats; and he shall set the sheep at the right hand, and the goats on the left."

There are many varieties of the wild goat, of which the kind found in the mountains of Abyssinia and Upper Egypt is supposed to be the wild goat mentioned in the books of Deuteronomy and Job. Some of the most highly-prized varieties of the goat species, are those of Cashmere, in the north-west of India, where several thousand looms are constantly at work, weaving beautiful Cashmere shawls. The soft silky and curling qualities of the hair of the wild goat, now in various parts of the East, were equally remarkable in the days of Isaac.

We find in Genesis xvii., that Isaac was so deceived by the softness of the hair of the goat which Rebecca had put on the hands and neck of Jacob, that the blind old man supposed it was the natural hair of the body of his eldest son.

In the catalogue of offerings for the tabernacle, we read, Exodus xxv., of "goat's hair" being presented with "blue and purple, and scarlet and fine linen." Travellers inform us that the hair of the wild goat of the East equals silk in beauty, and curls like the hair of women: it is combed off, not shorn. It has long been a principal article of trade at Angora and Aleppo. Some domesticated goats have been brought from Asia to this country and to the south of France; but whatever chance they may have of preserving the original excellence of their hair in the latter country, there is little doubt that it would degenerate in the hilly parts of Great Britain and Ireland, where a rough weather-proof fleece is so suitable and necessary to the animal.

Whether the common domesticated goat be derived from the wild goat of the rocks mentioned in the Old Testament, or be itself an original species, which is more probable, is not worth discussion here.

The common breed of the British Islands is as prolific and productive of milk as any other kind. Some of our goats attain a great size, and when of full age and with good management, will yield from one to three pints of milk daily during ten months of the year, and sometimes twin kids in the year. The flesh of the kid is delicious—provided the little innocent has not been stinted in its allowance of milk—being less luscious and more delicate in flavour than that of the lamb as usually fattened for the market; but if it be a mere framework of bones, it is hardly worth roasting. Whatever may have been the quality of the "savoury venison" of the patriarchal days, the flesh of an old goat of modern times is certainly tough and unpalatable; but very old mutton is tough also. The flesh of a fat young female goat is

decidedly good, and that of one somewhat advancing in years is quite eatable with proper preparation.

Pennant has recorded what indeed any person who has entered into the houses of the peasantry of the Welsh Highlands knows to be a fact, that the haunches of the goat are frequently salted and dried, and that they are substitutes there for bacon to the peasantry, who call it *cock yr wden*, or hung venison. The meat of an emasculated male goat, six or seven years old, which is called *hyfr*, is reckoned the best, being generally very sweet and fat. This makes an excellent pasty, goes under the name of rock venison, and is little inferior to that of the deer.

But it is for its milk that the female goat is most prized. It has been called the poor man's cow, and it well deserves a higher degree of consideration than it usually receives from us. The peasantry of the south of France have had such experience of the worth of goats in their household and rural economy, that 25,000 goats are maintained in the district of Mont d'Or, near Lyons, where a celebrated cheese is made from their milk. More than 40,000 goats are kept in France (principally in the southern departments), which number, compared with the number of pigs in the same kingdom, is as one to three.

Now pigs are decidedly more valuable and important to the cottager (whose interests I have especially at heart), and if the question were "Which shall he keep, pigs or goats?" my answer would be "pigs;"—but this is not the question; such is not the alternative, for he can often keep both. He can keep a goat very easily though he may have no suitable food for a pig, and in every case, without depriving his pig of any portion of its proper food. Our high hills and commons, and furze brakes, and full-grown woods, would support an incalculably greater number of goats than are maintained. The weeds that grow by the wayside and in the fields, and the waste of a garden, turnip

or potato peelings, heath, or indifferent hay, will feed these creatures, which eat any vegetables offered to them. The goat will eat herbs which the sheep rejects, unless it be almost starving, and even feed on the common hemlock, which is poisonous to the cow. Wherever a green leaf is to be had, the goat may be supported; but in a well-cultivated country, that leaf must be plucked for it. This animal must not be allowed to ramble and pull leaves for itself, else it will destroy shrubs and young trees at a fearful rate, and jump over any fences to cull whatever it may fancy. Except on wild land, then, goats are an intolerable nuisance if at large, and are therefore justly the subjects of very heavy fines under the trespass acts: but as this animal bears confinement well, and can be easily led by a string to proper feeding-places, or tethered on some common, or field, or brake, where it cannot do mischief, it may surely be kept without interfering in any degree with the claims, wants, or privileges of the pig or of any other domesticated animal.

A goat is a harmless and playful pet for children, and can be trained to draw them in a little cart. Even the stern soldier takes pleasure in the gambols and docility of the goat. Mr. Cobbett, who was a soldier in his earlier years, mentions in his "Cottage Economy," that when he was in America many goats belonged to his regiment, and went about with it on ship-board and everywhere else, and that they were never fed: they picked up grass and leaves in summer, and lived in winter on whatever scraps were thrown out from the soldiers' huts. We may suppose, however, that they were pets with many kind-hearted men, who never let them suffer from severe hunger. There is at least one gallant regiment, which has the goat for its "badge," and is always accompanied by one or more of these companionable and spirited creatures, which are (in the male sex) so really emblematical of courage, hardihood, and endurance.

Advantages of keeping Goats. Useful Properties of the Goat.

Almost every cottager, now-a-days, drinks tea—or what is called tea—though frequently he cannot procure milk with it. What a luxury then to him and his little ones would be the milk of a goat or two! This milk, besides a kid (or perhaps twins) from each of those every year, would surely be a very beneficial recompense for the easily-procured food which would support them. The quality of goat's-milk, too, is good. Invalids know that it is excellent: its lightness on the stomach, and nutritiveness, make it suitable to them.

The hair, skin, fat, and horns of the goat serve many purposes. The hair is convertible into wigs for judges and barristers; the skin is used for making gloves; the horns for knife-handles and snuff-boxes, and the suet for candles. If the skin be not deprived of the hair, it is a capital material for a working-man's winter-coat, or for a gentleman's shooting-jacket. Vast numbers of men wear such coats in France (as some of the Scotch wear deer-skin dresses handsomely prepared), for their protection against rain and cold. It is not worn by them, however, as the celebrated Brien O'Lynn wore his sheep-skin, viz. "with the woolly side in,"—for its refreshing coolness in summer,—but with the hair outwards. It throws off water as the feathers of a duck would discharge it, and is a very durable garment also. Goat-skins also are much used in the north of Scotland as a protection to carpets, in the same way that matting is employed in England.

RABBITS.

CHAPTER IX.

Rabbit house—Hutches—Feeding-troughs—Various breeds—Food—Times of feeding—Breeding—Fattening—Diseases—Profits—Great breeding establishment.

THE present chapter will be about rabbits, and the best methods of breeding, rearing, and managing them. Older persons than boys may think it worth while to take the pains of paying attention to this useful and profitable species of live stock.

Almost every boy in the course of his life takes a fancy to rabbit-keeping, and yet scarcely one knows how to treat these creatures properly. Countless numbers of them have been starved by neglect (not wilfully perhaps), poisoned with filth or foul air, or otherwise destroyed by injurious treatment; while, on the other hand, a great many have been killed by giving them an over-abundance of improper food.

Rabbit-house.

The first and most important matter is to have a good dry house or shed, in which the rabbits can be well protected from damp weather. Too much moisture is as fatal to them as it is to sheep: it gives them the rot.

But though you keep out moisture from your rabbit-house, you must not at the same time exclude fresh air;

for rabbits can no more be in health without fresh air than human beings. It is sheer folly to suppose that any living creature can be maintained in health and vigour without an ample supply of that "balm of life"—fresh air. Disease and death are the natural consequences of a vitiated atmosphere.

Many writers, and among them Howitt, in that delightful work for boys, "The Boy's Country Book," advise that rabbits should not be kept in hutches, but in little houses, so constructed that they may have protection from the weather, and at the same time enjoy their liberty and amuse themselves. This house may be built about four or five feet square, as may be convenient, with a roof formed to carry off the rain. The floor should be boarded or paved, to prevent the rabbits from burrowing, and have hay or straw laid on it. Some boxes must be provided, placed on the floor, with the open side downwards, and with holes at the sides for the rabbits to go in or out. Sliding doors to these boxes are convenient, to shut in the rabbits when necessary.

In the front of the house there should be a little court or yard railed off, into which they may be allowed to run when the weather is dry; and here they will sport and enjoy themselves, and give opportunities of observing their pretty gambols.

But this house will only do for young rabbits, or until they are about five months old; after that age they would begin to tear each other to pieces, if left together; all the pleasure you had in witnessing their former harmony and happiness would be gone; the bucks would fight dreadfully, and the litters the does might have would be destroyed; it is necessary, therefore, that breeding-does should be kept in hutches, and the bucks separate from one another. But young rabbits should be allowed to have their liberty in their house, as they will be far more healthy, and will grow much better in such case than if cooped up in hutches, without room for exercising their limbs.

Hutches.

These should be made as large as may be convenient, lest the rabbits be cramped from want of free exercise. Hutches for breeding-does must have a partition, so as to form two apartments, one for feeding, the other as a bed-room. Single hutches (those with one room only) will do for young rabbits or for bucks to be kept in. The door of the feeding apartment should be made of wire, but that of the bed-place must be of wood, as the doe likes darkness and concealment when she has her litter. It is well to have a sliding-board to divide the two compartments, and to shut out the rabbits when the hutch is to be cleaned, as it is very inconvenient to do this with the rabbits running about. The floors of the hutches should be quite smooth, that the wet may run off; and in order to facilitate this, a small slit or opening in the floor at the back of the hutch should be made, and the hutch itself be put sloping, a little higher at front than at the back, for when rabbits have much green food, there is a considerable quantity of liquid to be drained off, that they may be kept dry and clean.

The hutches may be arranged in rows one above the other around the house, to any convenient height; and each row should project at the back beyond that under it, in order that the wet may not run down into the hutch beneath. If a trough be placed on the floor behind the hutches, it will serve to carry off the liquid into some convenient receptacle.

Feeding-troughs

are usually made in the form of a long open box, but this is inconvenient in many respects, as the young rabbits get in and spoil the food, and the older ones scratch out much of it, tread it under foot, and waste it. A better plan is to have a swinging board in front; the rabbits,

when they feed, push it inwards with their foreheads, and when the head is withdrawn, the board flaps back against the front of the trough.

Various breeds.

There are many kinds of rabbits, varying in size, form, colour, length of legs or fur, and position of the ears; but the races have been so continuously intermixed and varied, by breeding, that it is a difficult task to point out any distinct kind as preferable. The smallest and short-legged variety, of the colour of the wild rabbit, appears to be the hardiest. Boys generally prize Lop-ears, though they are scarcely so pretty in appearance as the common kind. There is a single or double lop, according as one only, or both ears are dropped. Smuts, too, are favourites, either single or double. The smut is a black spot on the side of the rabbit's nose, and a spot on each side constitutes the double smut. Some of these are very beautiful creatures, having a white silvery fur, with rich, glossy, black spots, and they are generally large-sized rabbits.

Food.

This is an important matter; rabbits eat a very great quantity; you must not think that, because they are little animals, they require only a little food; they consume a great deal in proportion to their size; and to give them proper kinds of food, in sufficient quantity, and at a low expense, constitutes the chief question as regards their profit. How often do we hear it said, and how generally true is the saying, "Oh! my rabbits never pay, they eat their heads off," &c., meaning that the expense of the food consumed more than counterbalances the advantage gained. Now, this arises from want of practical economy as regards their keep. For the greater part of the year, rabbits may be kept almost entirely upon food procured from the field or garden. Although green food is natu-

rally their food, yet, because when injudiciously supplied it scours and gives them the rot, it is erroneously supposed that it should be almost entirely withheld. It is true, that if green food be given to them in a wet state, or if it be of a very succulent quality, a bad effect takes place; but if it is given in sufficient variety, dry, and with a small supply of good hay, oats, or bran daily, there is not the least danger in giving an unlimited quantity of it.

All through the summer there will be an ample supply of food for them from the garden and hedges. Dandelion, groundsel, sow-thistle, dock-leaves, peas-haulm, lettuce; strawberry, raspberry, and currant leaves; carrot, parsnip, potato, and horseradish tops; all kinds of grasses, celery, French-beans in the pod, vine-dressings, apple-parings, &c. &c. But we need not enumerate more varieties, for there is scarcely any vegetable which rabbits will not eat; but before all other things they prefer parsley, carrot-tops, French-beans, and the leaves, stalks, and pods of beans and peas.

As soon as the peas and kidney-beans have done bearing, let them be pulled up and given to the rabbits, together with all the pods not wanted for use. In the autumn, when green food becomes scarcer, waste scarlet-runner stalks, of which they are very fond, come to their aid; also the leaves which now fall in abundance from the apple and other trees; and when the garden supplies fail, there is generally plenty of marsh-mallows, docks, ground ivy, and grasses from the hedges, to yield an abundance of green food for some time longer.

In the winter, carrots, parsnips, Swedish and common turnips, together with brewers' grains, mixed with toppings or pollard, supply the deficiency of fresh vegetables.

Rabbits like the young bark of trees; for this reason they may get in the winter small branches and twigs pruned from fruit-trees, which they either bark or entirely consume. Nibbling these twigs is excellent

amusement for rabbits, and besides keeping them in health, serves as a portion of their food.

There is no need then for starving rabbits, when there is such an abundant variety of food suitable for them, and at all times to be procured. One writer observes, that "when rabbits die, ninety-nine times out of the hundred, starvation is the cause; and particularly, short-feeding the doe."

Times of Feeding.

It is best to feed rabbits three, or even four, times a day, because when they are fed only twice during that time, a larger quantity of food must be given at each feeding, which is too often wasted. They appear to relish their food most when given in small quantities, and you will soon learn how much to give at each time you feed, so as to avoid waste, and yet so that the rabbits shall have enough. The does must be well kept, both before and after they have young ones, or it is useless to expect their produce to be vigorous and healthy. A doe with a litter will eat twice as much as at other times, and must be liberally supplied with green food and carrots and parsnips, raw or boiled, as well as with oats and and hay.

Young rabbits, when they first come out to feed, must not be allowed to eat the greens with which the doe is supplied; but they may nibble at carrots and other roots, and at the little twigs above-mentioned, and gradually be accustomed to partake of a more moist diet: we have repeatedly seen litters die from eating green food prematurely,

Breeding.

Rabbits begin to breed when about five or six months old, and will give seven or eight litters in the year, though it is better to allow them only to have five. In

thirty days after being with the buck, the doe produces her young. A few days before the time, some hay must be given to her, with which, and the down she pulls from her fur, she will construct her bed. It is always a sign of the approaching birth of the young when she begins to bite down the hay, or carry it about in her mouth, and to tear the flue from her body. There are generally from four to ten young ones, sometimes more, but it is far better, when the doe has so many, to keep only five or six of the finest; they will then grow up strong and healthy, and the doe will not be so much weakened as if all had been preserved. At the end of six weeks the young brood may be removed, and the doe and buck brought together again. Great care is required during very severe weather to prevent the young from dying with cold; and for this reason it is better to allow the doe to rest during the winter. The best breeding rabbits are said to be those produced in March.

Like all other animals, rabbits degenerate when much breeding takes place among the same race for a long period: this is called breeding in and in. It is proper, therefore, to make changes from time to time, by procuring a fresh kind to improve your stock. Rabbit fanciers pay some attention to this: but if it were made more a matter of science, as it is with some other animals, a very superior breed of rabbits might be produced.

Fattening

There is no need to resort to any other method in preparing rabbits for the table than to give them as much oats, carrots, and green food as they choose to take; if fattened with corn alone, the flesh is not so juicy and well flavoured as when they are also allowed an unlimited quantity of vegetables. They are in the greatest perfection from about three to seven months old, and about a month's feeding, as directed, will make them thoroughly fat, provided they have not been half-starved previously.

The London poulterers exhibit fine specimens of fatted rabbits at Christmas, some of which weigh upwards of fifteen pounds; but it is not desirable to produce such over-fat animals of any class.

Diseases.

Rabbits are naturally very healthy and hardy. When due attention is paid to their food, to ventilation, and cleanliness, few animals are less subject to disease; but, as in all other cases, filth, foul air, and damp, produce disease in rabbits. Looseness, which may be seen by the dung being too moist, must be remedied by dry food, such as crusts of bread, good corn, old hay, hard biscuit, or any food of a dry quality. The rot may be said to be incurable, at least in young rabbits. The chance of remedy must be looked for in dry hutches, fresh air, and substantial food. The liver complaint, another disorder, is said to be also incurable; but as it does not prevent the rabbits from fattening, the best course is to prepare those attacked at once for the table. Snuffles or colds may be cured by removing the rabbit from the damps and draughts which have produced the disorder, to a drier and warmer place. It is much easier to prevent than to cure disease. Cleanliness, careful attention, dryness, and regular feeding in the manner we have directed, will in general insure good health in the rabbits, and entirely prevent any of these diseases.

Profits.

When the amazing fecundity of rabbits is taken into the account, it will readily be seen, that if the expense of food and management can be kept low, a great profit may be obtained from them. It has been calculated that from a single pair, the prodigious number of one million two hundred and seventy-four thousand eight hundred and forty rabbits might be produced in four years, sup-

posing all the individuals to live. But, in point of fact, they continually suffer destruction from one casualty or another; yet there is no reason why a family living in the country, and having a garden, should not derive advantage from the keeping of rabbits; and when the care of them can be entrusted to their own children, the cost of management would of course be diminished. The value of the dung, either for sale or for the garden, is considerable, as it is a very valuable manure. For any person living in a town, who has all the food to purchase, the attempt to keep rabbits for profit is to be totally discouraged.

A country cottager who kept rabbits in a small house, similar to the one above described, gave the management of them to his boys, who carefully attended them and collected their food. Without diminishing his stock, he was able to kill annually between three and four hundred, and derived good profit from the sale of them, besides having a rabbit occasionally at dinner for himself, and the advantage of their dung for his garden, and with hardly any expense or trouble to himself.

Some years ago, a person in Oxfordshire kept a few hundreds of breeding does in a small detached barn. He sent about three dozen rabbits weekly to London, but as the distance made the carriage of them expensive, very little, if any, profit was realized on the sale. But the dung produced by them was equal to one load a week, thirty-six bushels to the load, and sold for eightpence a bushel.

Great Breeding Establishment.

A description of a large breeding establishment has been given by Mowbray, which we shall now quote:—"Of late, one has arisen at Ampthill, Beds, upon a more extensive scale than ever before attempted, established by an agent of his grace the duke of Bedford. The building is situated upon an eminence, is square, some-

what resembling barracks, with a court withinside the walls, and with thirty acres of fine light land adjoining, under culture of those crops known to be best adapted to the nourishment and support of rabbit stock. It was proposed to keep between four and five thousand breeding-does, which number is probably now complete. The young rabbits, from seven to nine weeks old, are sent to Newgate and Leadenhall markets, fifty to sixty dozen weekly. The quantity of dung produced, which is reserved with the utmost care, and free from any extraneous substances, must be considerable and valuable."

This business has since come to an end, not it appears from failure, but because the manager had other and more important duties which required his attention.

THE HONEY-BEE.

CHAPTER X.

Bees brought to England from Flanders—General description of the bee—Reaumur's account of bees—Anecdote of two queen bees—Description of the sting—Further remarks on the natural history of the bee—Wonderful instincts and contrivances of bees—Advantages of keeping them—English and foreign treatment of them—Laying and swarming—Ventilation of the hives—On the union of swarms and hives.

THE natural history of this wonderful creature is extremely curious and interesting; but there is little space here for more than a very brief sketch of it, as the practical part of the subject is more important to the reader.

The race of bees which we possess came originally from Flanders, and is considered the best, from its remarkable activity, industry, and gentleness of character,—though it can sting when provoked, having a lance for the purpose, which is a gift to it from the Creator that has been denied to some tribes of the same general family. The Australian bees, for instance, are so defenceless in being without the sting, that the native savages catch them, and suck the honey out of their bodies with impunity.

The honey produced by the labours of the bee is mentioned as one of the chief attractions of the land of promise to the wandering Israelites. The land to which they were journeying was to be "a land flowing with milk and honey:" honey is frequently referred to by the sacred writers as very desirable food.

The ancient philosophers were, however, ignorant of

matters respecting the true nature of the bee in some particulars—such as the sex of the sovereign, and also of the sexual distinctions of her subjects—the workers and the drones. They judged that the monarch must be of the masculine gender, and that the great body of workers were so too. They supposed that there were two kings in each hive, concerning which they held very whimsical opinions.

But a more correct knowledge respecting bees was reserved for modern times. Swammardam, a Dutch physician, was the first who discovered, by dissection, that the sex of the monarch is female, and that the queen-bee lays an immense number of eggs, uniting in herself the two characters of sovereign and mother of her people.

Reaumur's Account of Bees.

Reaumur, the French naturalist, made interesting experiments and discoveries in the natural history of bees also; but Huber, who was a native of Geneva, and died in 1831, has written the most clear and satisfactory account of them, as he devoted many years of his life, both before and after he lost his sight, in an accurate study of all their instincts and habits.

The three ranks of bees pass through the successive stages of *egg*, *larva*, and *nymph*; but the future queen, while in the larva (or grub) state, is coiled up in her cradle-cells (two or three being thrown into one for her accommodation) in a position different from that of the other bees, and which tends to promote the greater length of her more tapering body.

The bee larva is a white worm without feet, and ringed all round. The larvæ issue on the third day from the egg state, and are almost motionless; the nourishment given to them by their nurses is a sort of jelly, consisting of honey and the pollen of flowers; and they live on this until they go out to obtain food.

The embryo queen is fed by her attendants with a richer jelly than that which the ordinary grubs receive. During six days she is nourished in a warm temperature; on the seventh, she becomes a *nymph*, and no longer requires food from her watchful nurses, who then close up the opening of the cell, in order, as is conjectured, to allow a free passage to the workers along the range of the royal apartments, which when open had obstructed their labours, or perhaps to cause greater warmth for the development of more vital power in the royal frame.

Be this as it may, a curtain of wax is formed over the nursery-door, and the inmate sets to spinning out of her own body what is termed the *cocoon*, which is a fine net-work for the lining of her cradle.

On the sixteenth day of her existence she tears to pieces this net-work, and with her teeth makes a little opening in the centre of the waxen partition, through which she puts out her head; and, after labouring during about three hours to enlarge the orifice, she comes forth a full-grown queen, and is immediately surrounded by her delighted subjects, who brush her wings, and relieve her from any impurities of the cradle. Her sovereignty is at once acknowledged, and her influence is without limit.

As the appearance of the queen should be at once recognized by the bee-keeper, it must be now described. Her body is longer, larger, and more pointed than that of the others, and her wings are much shorter than theirs, hardly reaching beyond her middle, whereas those of the others cover the entire body; her belly and legs are of deep golden colour, and the latter are not furnished with the little brushes which those of the workers have to help them in collecting the floury matter which they require for making honey.

Anecdote of two Queen Bees.

The queen bears no rival authority. If there should be a second queen, she is either sent forth with an attendant swarm of colonists, or put to death by the other bees.

Huber gives an account of a duel between two queens, who, issuing from their nurseries in the same hive, rushed into deadly conflict, catching each other with the teeth. As if they dreaded the fatal consequences to themselves, which would follow from unsheathing their darts, they had the prudence to separate at the height of their fury and fly away. But the other bees compelled them to decide the point of sovereignty on the spot, and then forced them to the contest again. This was done repeatedly, after intervals of breathing time, until the stronger of the two, seizing the other by the wing, stabbed her to death.

Description of the Sting.

The lance, or dagger, which all but the drones possess, is of exquisite workmanship. This is the description of it, seen through the microscope: "Upon examining the edge of a very keen razor through the microscope, this appears as broad as the back of a pretty thick knife, rough, uneven, full of notches and furrows, and, so far from anything like sharpness, that an instrument as blunt as this seems to be, would not serve even to cleave wood; an exceedingly small needle being also examined, the point thereof appeared about a quarter of an inch in breadth, and not round nor flat, but irregular and uneven, and the surface, though extremely bright and smooth to the naked eye, seemed full of ruggedness, holes, and scratches,—in short, it resembled an iron bar out of a smith's forge; but the sting of a bee, viewed through the same instrument, showed a polish most amazingly beautiful, without the least flaw, blemish, or

irregularity; and indeed with a point too fine to be discovered. Yet this is only the sheath or case of instruments much more exquisite contained therein."

Further Remarks on the Natural History of the Bee.

With respect to the bees generally, the workers become nymphs on the fifth day, but the drones indulge in the inactive state of larvæ one day longer. All the bees spin the cocoon when in the nymph state, and after some days, as in the case of the queen, become perfect bees.

The queen lays an amazing number of eggs in the course of the season, from March to May. She will deposit in the cells from twelve thousand to twenty thousand; and there is another laying from August to October: she lays from one hundred to two hundred daily, until she has produced her thousands. The occupations of rearing the young, forming cells, providing materials for the wax and honey, working them up, and storing provisions, devolve upon the workers, of which there are, on an average, sixteen thousand in each hive.

Scarcely has the queen laid the germs of her new family in their birth-places, when the workers visit them, and become their nurses, provide for their wants, and give them food. They watch day and night for the public good, and would die in defence of their beloved sovereign.

The drones constitute about a tenth part of the population of a hive: they are distinguished from the workers by their greater corpulence and shortness of body. They are certainly idle and lazy, but they fulfil the intention for which they were created. They are probably agents for fecundating the eggs when deposited in the cells.

It would be unjust to condemn them for not collecting honey when they are not provided with the organs for

doing so, as the workers are; their teeth are too little and short for breaking off the capsules, their mouths are not well formed for sucking the sweets of flowers; and their legs have not those brushes or powder-puffs which enable the others to bring home the farina wanted for making wax. During the summer they find food for themselves, and pass their time in lounging from flower to flower, and they are not found in the hive during the winter. By an extraordinary instinct, they are massacred without pity by the females before this period, in order to save the winter stock of honey, until they have departed voluntarily to some nook where they may rest until wanted in the next spring. These poor things have no weapons of defence.

Wonderful Instincts and Contrivances of Bees.

The contrivances of bees in the construction of their combs is amongst the most wonderful works of God, as regards insect creation. "The form of the comb is in every country the same, the proportions accurately alike, the size the same, to the fraction of a line: go where you will, and the form is proved to be that which the most refined analysis has enabled mathematicians to discover, as of all others the best adapted for the purpose of saving room, work, and materials. This discovery was only made about a century ago; nay, the instrument that enabled us to find it out was unknown for half a century before that application of its powers. And yet the bee has been for thousands of years, in all countries, unerringly working according to a fixed rule, which no one had discovered until the eighteenth century."

We may instance among other surprising illustrations of the ingenuity of these wonderful creatures, that they lay the foundations of their cities at the top of the hive and build downwards. They have straight passages or lanes across their different dwelling-places, wide enough

for two bees to pass, and in everything show the hand of the Almighty Architect.

Advantages of Keeping Bees.

It is strange, that though the expense of establishing stocks of bees, where there is a garden, is so trivial, and the possible gain so great, few people take the trouble of keeping them. Country cottagers too generally neglect to take advantage even of an adjoining common or lonely garden, which specially invite to bee-keeping. Where cottage gardens are very small and crowded, and multitudes of children swarm, it is certainly difficult, if not dangerous, to introduce tens of thousands of bees, with their formidable stings; but in numberless instances where bee-husbandry is neglected, it might be pursued with some profit.

No farmer, nor even humble cottager, who has a patch of garden, and lives near commons, heath-covered hills, or woods, should be without hives, as the great supply of bees' food is obtained by their own exertions. It is not the rarest and most beautiful flowers which afford the best honey, but those which abound in the open fields as well as in the garden: the flowers of mountain heath, clover, trefoil, beans, vetches, wild thyme, turnips and cabbages, privet, elder, bramble, rue, and, above all, the blossoms of the common furze, are among the best materials for honey. The cost of food is scarcely anything, and the return may be considered clear gain.

The trouble of rearing bees, compared with the pleasure or the profit, is nothing. Enormous sums are annually paid in Great Britain and Ireland for bees'-wax imported from foreign countries; why should we not produce more of it at home?

It is to be lamented that so few persons keep bees, an occupation from which so much actual gain may be derived, and so many useful lessons of industry and domestic economy learned.

How beneficial would be the result to any family, if the keeping of bees and the example of their wonderful habits, should lead the father of that family from low and sensual pursuits, to the simple and natural pleasures associated with bee husbandry and the cultivation of the garden.

In addition to the positive profit and pleasure which would arise from bee-keeping on a more extended scale, there is an indirect advantage which must not be overlooked, namely, the increased productiveness of gardens and orchards; for our Creator appears to have designed the honey not so much for the use of man as to attract the bees to the blossoms, that they may carry the pollen or dust from flower to flower, and render them fertile. It is a well-known fact, that the fructification of flowering plants is accomplished by the dust from the pistils of what are called the male blossoms being deposited in the interior of the female flowers; and thus orchards have been known to produce double the crop after bees were kept there than ever they did before: hence it has been well said, "If there were no bees there would be no apples."

The compiler of this article on bee-keeping, as it first appeared, and which I am revising and remodelling, presses the expediency of never killing bees, and also of preventing their swarming, as the best features of the modern method of bee-keeping. I give his views on the subject, and the reader may form his own judgment respecting them.

English and Foreign Treatment of them.

The usual method of keeping bees in England is that of annual renewal and destruction, a practice to be condemned, not only on the ground of cruelty, but also from the serious loss thereby occasioned. In every other country of Europe the practice is different: bee-keepers never destroy their bees, but take away a portion of their

produce, and leave them the remainder for winter sustenance. Thus, some place one hive above another, and in the autumn remove the upper one: others turn out their hives and cut out as much comb and honey as they think the bees can well spare, and by these means they obtain from 20lb. to 40lb. of honey from each hive, and still keep up their stock of bees for future seasons. This method, imperfect as it is, is far superior to that adopted by our country people, of smothering the bees with brimstone.

Let us suppose a bee-master in Germany to possess twenty stocks of bees—and many have from 150 to 200—and he takes 30lb. of honey from each; he has 600lb., and still retains his twenty stocks; whereas, by the English method of choosing annually the heaviest and lightest stocks for destruction, supposing ten hives are taken, and each produces 30lb., we have but 300lb. of honey, and only half the stock with which to commence the ensuing year.

But the foreign method, though possessing such advantages, does not equal what may be done by the better management about to be explained.

Laying and Swarming.

The queen bee lays from 10,000 to 30,000 eggs in the year. In a stock containing 3,000 bees, almost all of them in ordinary years will be busy in nursing the grubs, for they are such good mothers, that they think it their first duty to feed their young; gathering honey is their second. A swarm goes off: you have two queens, each with 3,000 bees, busy in rearing the eggs which the two queens lay all the summer. They have no spare time to gather honey, and so in a bad year a stock with plenty of inhabitants will be often almost empty of honey when you take it up in the autumn, and sometimes these bees die even in the summer if not fed. Now if you prevent swarming by giving them plenty of room, 3,000 bees, which

were nurses before to the grubs of one queen, will be sufficient to do a great deal more of nursing work.

The original hive has only one queen, and one queen cannot lay eggs enough to require so many nurses, though two may. The other 3,000 bees prevented from swarming, will store honey for you in the spare room you may give them.

In order to obtain this, if you have your bees in straw hives, the following is the method:—Procure two boards, an inch and a half or two inches thick, and of a size a little larger than the breadth of your hives; let there be a piece cut out of the front, in a sloping direction, and another piece similarly on the right and left side of each, to answer the double purpose of doorway and drain, to allow the moisture from the hives to flow away more readily. The side entrances must be made to fit exactly, when the boards are placed together. Before swarming time, in May, a well-stocked hive of last year is to be placed on one board, an empty hive on the other, a small piece of wood being placed over that part of the two entrances which is between the two hives. Then stop up the doorway of the full hive, so that the bees may have no way of egress, except through that which is empty; and if possible, shift the new entrance along the stool on which you have placed your hives, until it comes opposite the part where the old entrance was: and, if this be sprinkled with a little honey or syrup, the bees will be soon accustomed to the change. Here, then, you have given your bees room, and instead of swarming, they will soon commence their work of building and storing in their new abode, while the queen, with the nurses, is occupied in rearing a new brood, shortly to come forth in strength, to assist in the common work. When the hive is full it should be removed, lest the bees, for want of room, should swarm off, or lose many days' work, by hanging out in a cluster at the entrance, as they are often seen to do previously to swarming.

The removal may be effected in this manner: in the middle of a fine day, when most of the bees will be out gathering food, cut off the communication between the two hives, by slipping a piece of tin between the side entrances. Shut up the open entrance, and push the hives along the stool, so that the doorway may be brought into the best position. If a great disturbance shortly take place at the mouth of one hive, it is a sign that the queen is in the other which you wish to remove, in which case you must take away the tin which separates them, and wait until another day. If, on the contrary, the bees go on quietly working, you may be sure that the queen is in the right hive, and that all is well. They must then be left until their labours cease in the evening, when, a little before dark, open the entrance, and the prisoners, alarmed at their long separation from their queen, will speedily find their way into the other hive to rejoin her. You may then remove the full hive, and placing an empty one in its place, take out the separating slide, which will leave it ready for operations on the morrow.

Here, then, you have a full hive, perhaps early in June, and that without destroying a single bee, before those on the old plan have commenced their honey gatherings, and at a time when the produce may be disposed of at a higher price than when the honey all comes to market in the autumn. But there is another thing connected with the anti-swarming system which is of the greatest importance in bee management — that is ventilation.

The queen bee will not lay her eggs in a temperature lower than eighty degrees, as this degree of heat appears to be necessary for hatching the young brood; therefore, if the new hive be kept cooler than this, she will remain in the old hive to raise her progeny, and there also the workers will deposit the pollen from the anthers of flowers, which forms the bee-bread, or food of the young offspring; while in the other hive nothing will be placed but the finest wax and honey.

Ventilation of the Hives.

To ventilate the hive, have fixed in the top a piece of zinc, as large as a crown-piece, punched full of small holes; this must be covered until the bees have commenced their combs, then the covering must be removed. The bees will endeavour to fill up the holes with *propolis*, a gummy substance, which they collect from the bark of trees, on which account you must daily keep the holes open by pricking them through with a piece of wire; you will thus ensure a regular and constant current of fresh air through the hive, entering at the doorway and going out at the top, keeping the hive cool, and enabling the bees to perform their work much more quickly and better than they are able to do without ventilation, while the result to yourself will be, that you will have the purest virgin wax and honey.

On the Union of Swarms and Stocks.

But the question is frequently asked by the defenders of the old system of bee-management, "If we prevent their swarming, by giving the bees room, how are we to keep up our stock?" To this we reply, "Keep a few stocks from which to obtain fresh swarms, but never take more than one swarm from any hive during the season." If a cast should come forth, the readiest way of returning it to the parent stock is to take the bees when they are quietly hived, and suddenly dash them into a large tub or pan of water, placed just before the hive from which they came; then put a board sloping upwards from the tub to the mouth of the hive, take out the bees with a skimmer, lay them on the board, and as they dry in the sun, they will ascend to their old habitation, apparently nothing the worse for this rough treatment. This is a plan we have frequently followed, and always with perfect

success, and have generally been able to make the queen a prisoner in her upward march with her draggle-tailed guards to her former habitation.

There will be no difficulty in recognizing the queen, from her greater size and more taper body; but even if she be not secured, no inconvenience follows, for she and her subjects will contrive to reunite, or another sovereign will be found or provided to reign in her stead.

DIRECTIONS TO BEE-KEEPERS.

CHAPTER XI.

Operations in January:—Hives and boxes—To carry a hive. March:—Management of the hives—Feeding. April:—Activity of bees—Preparations for swarms. May:—Swarming—Union of casts. June:—Keeping a register Uniting stocks—Feeding. July: Management of black combs Driving. August:—Changing bees from one feeding place to another. September:—Examination of hives—Feeding—Fumigation—Directions for extracting the honey and wax. October:—Feeding and preserving from dampness Housing in winter.

JANUARY.

During the first month of the year, and in all the winter months, bees require very little attention; indeed nothing more is necessary than to keep them dry, and in a position which cannot be affected by gleams of sunshine.

Hives and Boxes.

Hives and boxes may now be made ready for the ensuing season. For several reasons, we are inclined to recommend straw hives in preference to boxes for bee-management: they are more easily procured, they are cheaper, and if properly protected on the outside, have less tendency to contract damp, which is so fatal to bees. Besides, they have a pretty rustic appearance about them, which boxes, however ornamental, are deficient in; and there is nothing that cannot be accomplished with them, if they rest upon bottom boards of the kind we have described, as easily as with boxes.

FEBRUARY.

If your hives have been placed in winter-quarters, and the weather at the end of the month prove mild and open, remove them to their summer stands. If, on the contrary, it be unfavourable, you had better keep them sheltered as you have done through the winter. Perhaps the safest guide, as to the time when bees may be allowed to go abroad, is when the primrose and other early spring flowers put forth their blossoms, as this time varies in different situations, according as we approach the northern or southern portions of the kingdom.

Before settling the hives for the summer, weigh them, and note down the weights in a book; you will see by this what quantity of honey has been consumed through the winter, and also be able to tell what feeding the bees will require if the spring be backward.

We do not, however, advise feeding yet, for—until all probability of frost and snow be past—it would be injurious to excite the bees, of whom many would fly abroad, and prematurely perish; thus diminishing the heat of the hive (maintained by the number of inmates), which should be preserved as much as possible, in order to facilitate the hatching of the young brood, which will soon begin to make its appearance.

Keep the entrance to the hive nearly closed, let it be only wide enough for one bee to pass at a time.

This is the best month in the year for purchasing stocks. The bees have lived through the winter, so that you do not run the risk of losing them, as you would have done by buying them in the autumn. You may judge if a stock be a good one, and in a healthy prosperous condition, by observing, on a fine day, whether many or few bees enter the hive with little golden-looking pellets or balls on their hind legs. This is the farina of flowers, or bee-bread, as it is called, which is now col-

lected by the bees for the nourishment of the young, and forms their principal labour at this season. If you see as many as twenty or thirty every minute going in so laden, you may judge the stock is prospering, and regulate your purchase accordingly. If they do not come out in bad weather, it may be assumed that they have a good store of provision within.

Hives should not be generally removed later than the end of this month, as the bees do not readily take to a new situation when the spring is more advanced.

To Carry a Hive.

Let it be placed on a cloth, the ends of which must be carefully tied over the top; if it is to be taken to a distance, the hive so tied up may be swung on a pole, fastened across a cart from side to side; this prevents the jolting to which it might otherwise be subject, which would disturb the bees, and probably shake down the comb. When arrived at its destination, let the hive be placed on the stand, and if any of the bees have fallen out on the cloth, place them near the entrance, and they will soon find their way in.

MARCH.

Management of the Hives—Feeding.

As soon as the weather is fine, the hives which stood in the open air during the winter should be examined. Lift them carefully from the stand. Clear away all the dead bees and refuse matters which have collected during the winter. Rub the mouldiness and damp from the floor-board, and let it be well dried. The bottoms of the combs often become mouldy in the winter, especially in light stocks, and it will be a good thing to cut off the lower portions, which may be done with a table-knife,

and without danger, by turning the hive on one side, in the evening, or early in the morning, or at any time, if you take the precaution of smoking a pipe during the operation. The bees will soon renew the combs, and their health will be improved by the removal of the decayed portions.

At the end of the month, if the weather be warm, let the straw hackles be removed, in which mice often lodge themselves, working their way into the hives and destroying them; but do not leave the hives without some protection; cover them with something that will keep off the rain. Do not enlarge the entrances, unless for a part of the day when the weather is very fine, when they may be opened wide enough for two or three bees to pass together.

Feeding.

Begin to feed the light stocks; a liberal supply of food will be amply repaid by the consequent health and vigour of your bees, and the abundant store they will collect for your future benefit. And do not prematurely encourage the bees to go in search of food, but rather confine them to their homes. Guard against the admission of stranger bees while yours are feeding. Give honey now, if you can, rather than syrup, as it forms a better ingredient than sugar in the jelly which supports the young brood.

The consumption of food in a hive is now perhaps greater than at any period of the year. The queen lays from one hundred to two hundred eggs daily, and the increase of the brood is so prodigious, that it is impossible for any except a well-stored hive to meet the demand for food. Many persons wonder that their bees die in the spring, when they have survived the winter; but we have before shown that the food consumed during the cold weather is comparatively very small to what it is during breeding time. On this ground, then, feed abundantly all the stocks, but especially the light ones.

Feeding outside the hive, by placing food at the entrance, is a bad method, as stranger bees are attracted, which deprive your bees of a proportion of that which you have provided for them. Feeding at the bottom disturbs the bees, lowers the temperature of the hive when the food is introduced, and thus occasions loss of life: therefore, to obviate these evils, ingenious feeding-pans have been invented for supplying food at the top of the hive.

APRIL.

There will be a great increase of activity in the hive this month. As the spring opens, flowering plants and fruit-trees will be in bloom. On account of this increasing supply of food from abroad, there is the less necessity for feeding; yet it should not be entirely discontinued, particularly if the weather prove wet or cold.

Activity of Bees.

Multitudes of bees will now be seen passing out of the hive, and returning richly laden with honey and farina. There will be great pushing and apparent confusion at the entrance, in consequence of the additional labours of the season; for this reason you must enlarge the mouth of the hive, but not yet to its full size.

It is not uncommon at this season to find a hive which exhibits none of this industry and activity. Bees, few in number, and to all appearance without any object, may occasionally be seen going out and in, or lazily buzzing before the hive. If there is no want of honey, the most probable cause of this inactivity is the death of the queen from some accident during the winter. The bees in such a case gradually forsake the hive and mostly perish, though some few probably become united to other stocks. There seems to be no alternative, as soon as the loss of the queen is discovered, than to endeavour, by removing the hive to a dry place, to preserve the lives of as

many of the bees as possible, in order to unite them with a late swarm, to which they will prove of considerable benefit.

Preparations for Swarms.

Everything necessary should now be prepared for the establishment of swarms, which may be expected during the next two months, else there may be running hither and thither while the swarm takes wing and is lost through your delayed preparation. Hives, or boxes if you intend to make use of these, must be kept dry and sweet; stands or stools to place them on must be prepared, and a hand-brush, leather gloves, crape, or other covering for the face, placed in readiness.

As bees require water to drink, especially through this and the next month, it is necessary to place some for them, if there is no pond or rivulet near. Cotton says that, in the Isle of Wight, the people have a notion that every bee goes down to the sea to drink once a day. Water is needful for them in the breeding season, and they will drink water with salt in it, and like it better than the freshest brook that runs. It is very curious to see how they will flock by thousands to the drinking-troughs in April, May, and part of June; and then their thirst seems to be quenched all of a sudden, for not one will be seen at them. The reason seems to be that they do not want so much water after the greater part of the young brood is hatched.

Shallow dishes or plates filled with water, and having thin boards (pierced with small holes), floating on it, from which the bees may drink without fear of drowning, are convenient. Small pebbles or moss, placed in the plates with the water, will answer almost as well.

MAY.

The instruction for this month will be to those who keep bees in common hives for the purpose of swarming,

as well as to those who have adopted the method of preventing swarming in order to procure honey.

Bees usually swarm in the months of May and June, sometimes a little earlier or later. The most valuable swarms are those which come at the end of this, or the beginning of next month. The earlier part of May is often cold and wet, the bees are hindered from honey gathering, and unless fed, would decrease in strength very much, and perhaps eventually perish.

The chief indication of swarming being about to take place is the gathering of the bees at the entrance of the hive, where they cling to each other, and hang in a cluster under the board. This clustering is evidently the natural instinct of the bees, which leads them to assemble together in the same manner as when they are making comb within the hive; and as the hive is now quite full, they are under the necessity of remaining in idleness until the time the queen may be ready to accompany them, to form a new colony. Sometimes they will thus dangle for a fortnight, or even a month before they swarm. That this swarming is an act of necessity, not of choice, is evident from the fact that they often begin to construct their combs under the hive board.

It would be a pity to allow these bees to be thus idle in a fine season, when they are quite willing to work; they will lay up a small store of honey for you if you will provide a way for them. For this purpose, if you have a hole at the top of the hive, take out the bung which closes it, and place upon it an inverted glass or flower-pot, which will contain about eight or ten pounds. A board about an inch and a half thick, with a hole in the centre (for the bees to ascend through) should be laid between the top of the hive and the glass. The glass or pot will be filled in a week or ten days, or a fortnight at farthest, and the bees will not be prevented from swarming one day later than they would have done if they had all been out swinging in idleness. The glass

or flower-pot can be removed by carefully slipping two thin plates of zinc between it and the board, and then lifting away the upper plate together with the glass to a place of safety: the other plate, which has in the mean time prevented the bees from coming out at the top of the hive, may then be taken off, and a bung placed at the hole; the bees remaining in the pot may be removed in the evening to the hive, after being chloroformed or fumigated.

Clustering is not the only sign of an approaching swarm. The appearance of the drones about the middle of the day, a kind of hum, a shrill piping sound in the hive in the evening, and the restlessness of the bees, are also indications; and generally, when on a fine morning very few bees are at work, while on the day before all was activity and bustle, it is pretty certain that the swarm will rise in the course of the day. But sometimes they swarm without any notice; so it is better to have some one to watch on fine days, from about nine in the morning till three o'clock, that it may be known immediately when a swarm has gone off.

No one need be afraid of bees when they swarm; they appear to be fearful themselves at that time, and are usually quite peaceable. But as all persons have not courage, it is much safer to have gloves on, and the head and neck covered with a hood of gauze, crape, or thin linen; and thus protected, any one may venture to hive bees with impunity. Throwing dust or water among them during their flight is often injurious; and music! from your warming-pan and door-key, or your tongs and shovel, is of no use, and may hinder you from attending to something necessary to be done. If possible, get a person who is accustomed to it, to hive the swarm; but if not, attend to the following directions:—

If the swarm is to be put into a straw hive, let this be new. Lose no time as soon as your swarm is settled on a bough, or they may be off, and you will probably lose them. Spread a table-cloth or a sheet on the ground under the

swarm. Place the hive-board upon it. Let one person hold the hive turned upside down close under the swarm, while another gives the bough a sudden shake, so as to jerk off the whole mass of bees into the hive, which must then be turned down upon the cloth, the edge being a little raised by a stone or bit of wood, that the bees may not be crushed. If the swarm be hanging upon a small branch, it may be cut off, and let fall into the hive. When on the thick branch of a tree, there will be more difficulty. In this case hold the hive under as before, and sweep the bees into it as carefully as possible with a soft hand-brush. If the queen be swept into the hive, the bees will soon follow. Should it happen that they swarm high up in a tree, these directions must be followed as nearly as possible by persons mounted on ladders.

This swarming is necessary in order to increase or keep up your stocks; but of course it should only be allowed from hives kept on purpose, as the new system is intended to prevent swarming, in order to procure a plentiful supply of honey from the increased population.

Union of Casts.

Never on any account hive a cast with the intention of keeping it by itself through the winter, or for taking up in the autumn; rather return it to the parent hive or unite it to one of the earlier swarms, so as to make a strong stock. Unless the year be unusually favourable, casts never do any good, while the old stock is often so weakened by the loss, as to be almost worthless in the autumn, or for preserving through the winter.

You may unite casts by intoxicating the bees, with the smoke of the fungus called powder-puff, and make them drop from one hive into another, taking care to have but one queen, however numerous the union may be.

If unfavourable weather ensues shortly after the

swarm is hived, feed the bees; it will strengthen them and prove a gain to you in the end.

The entrance into the hive should now be enlarged to its full size, that the bees may have abundant room in the busy season of honey-gathering. Side-boxes may be opened; they need not be ventilated for two or three days, until the bees have well taken to them and begun to form comb; after this, however, great care must be taken to ventilate well, in order to keep them cool. Give plenty of water, but so that the bees may not drown themselves. Shade the hives from the burning sun, which makes them so hot that the bees can scarcely work, and sometimes melts the combs, causing them to fall down and smother the bees. Feeding old stocks need not be continued unless the weather be unusually unpropitious.

Bees kept in hives or boxes on the improved system must now have additional room given them, in order to prevent swarming (see page 87).

Keeping a Register.

It is a good plan to keep a register, in order to see how long the bees are in filling the hive, and for comparison with future years. The following extracts from our own diary will show the plan:—

1850.	Hive No. 2.
May 22.	Opened right-hand side box.
,, 26.	Bees commenced work in ditto.
,, 31.	Opened left-hand box. Bees immediately began labour.
June 12.	Took away right-hand box. Weight of honey 12lb.

A daily register of the weather will also be very useful. Be careful to give room in time, and to take away the

side-hive as soon as filled, or the bees may swarm. If they do so, return them to the parent stock by the plan recommended at page 86.

Uniting Stocks.

Weak stocks may be strengthened now by having casts joined to them, either by the method given at page 87, or in the following manner:—On the evening of the day the cast is hived, as soon as the bees are all quiet, turn up the hive, and sprinkle the bees with syrup: then suddenly shake them out altogether upon a table; place the hive in which they are to be united above that mass of bees, and support it that none may be crushed; both will very soon become one stock. Late that night, or very early next morning, the hive must be placed where it is to remain. Many bee-keepers adopt this method with success. Casts may be joined together in the same manner, so as to form a strong stock, instead of two or more worthless ones.

Feeding.

People sometimes wonder how it is that their bees die in the summer; this very often happens in hot dry weather, when the flowers afford no honey, and there is no supply for the young brood, and the nurses are obliged to cast out from the hives the grubs, which perish thus by thousands. A little timely feeding at such a season would preserve their lives.

JULY.

Management of Black Combs.

The combs in hives that have stood for several years become black and useless, because the bees never clear out the cells in which the brood has been reared, and the skins which the young bees cast gradually fill up the cells

until they are too small for breeding in; in consequence, the hives get weaker and weaker; swarming cannot take place, and at last the bees die.

To prevent this fatal end, you may in spring, before breeding-time commences, after fumigating the bees a little, turn up the hive, and cut out half the comb; put the bees in again, and during the summer they will fill up the vacancy, and have room for breeding. Next spring take out the remainder of the old comb in the same way. One stock treated in this manner is said to have been kept for the long period of sixty years. Sometimes, when a stock has not swarmed, it is desirable to remove the bees altogether from the old hive into a new one. This must only be done during the first week in July; if attempted earlier, the new brood not being all hatched, May bee-grubs would be destroyed, and you would have a weak stock. On the other hand, if transferred later, there would not be time for them to make their comb, and lay up winter store. Fumigate or intoxicate the bees at night, and put them while stupified into a new hive, taking care that the queen is among them; place the hive on the stand in the same position the old one occupied, and on the morrow they will commence their labour as a new swarm. If the weather be fine, they will do well; but if they are found to be weak in autumn, take them up and unite them with another stock.

Driving.

Driving bees is sometimes adopted instead of fumigating. The operation is as follows:—Put the new hive upside down in a pail or pan; place the old hive carefully upon it, and tie a cloth round to keep the hives together, to prevent any bees from escaping. Turn the hives up, so that the old one may be at the bottom, the new one above. Tap gently with a stick round and round the old hive until the bees ascend to the new one. As soon as they appear to have gone up, put the new hive on the

stand in place of the old one. If the queen is in the new hive, the bees left in the old one will soon rejoin her, if the old hive be placed near. This method is best practised in the evening.

Now take side-hives and boxes when they are filled, as directed (page 87). Prevent swarming in July; late swarms never do any good.

AUGUST.

Changing Bees from one feeding-place to another.

On the Continent, and in some parts of our own country, it is usual to take bees to different places, in order that as food fails in one part they may find a supply in another. Cotton says:—"In France they put their hives into a boat, some hundreds together, which floats down the stream by night, and stops by day. The bees go out in the morning, return in the evening, and when they are all back and quiet, on the boat floats. I should like to see this tried on the Thames, for no river has more bee food near its banks.—willows, the best bee food in spring; meadows, clover, beans, and lime-trees, in different places and times, for summer. A handy man who could make his own boxes, though not up to hard work, might, I am pretty sure, gather through the mouths of his many thousand bees enough to fill his own one mouth, though it be somewhat larger. He might float softly down the river, as the flowers go off at one place and come on at another; and any bargeman would be glad, for the small price of one pound of Thames honey, to give him a tow up when he wants to go back. I should like to see it tried!"

In Yorkshire it is a common thing for cottagers who live near the moors to be intrusted with the hives of other persons who have not this advantage. They charge about a shilling for each hive; and during the months of August and September these bees have a good honey-g from the heather then in bloom, and are after-

wards returned to their owners, who reap a good profit from the visit their bees have made.

Whoever has the opportunity will do well to send his bees to the neighbourhood of heaths at this season; for bees do not find their food in corn-fields. This is the great honey-harvest month for you. Let us again urge the merciful recommendation—do not kill your bees,—do not take the honey by suffocating with brimstone. Fumigate with the fungus or other substances as we have recommended, and unite the bees to strong stocks to stand the winter. Thus you get the honey, and yet save your bees. Now contract the entrance of the hives, to guard against mice or other robbers.

SEPTEMBER.

This month is the proper time for carefully inspecting your stocks, to ascertain which will stand the winter, for feeding those which have not sufficient food, and for uniting weak stocks to strong ones, as recommended previously.

By gently striking the hives, you may judge whether they contain many or few bees, from the greater or lesser noise they make in the buzzing which immediately follows. Do not leave any to remain for the winter but such as weigh about 20lb. But recollect that a hive with two thousand bees will be more likely to survive than one with only one thousand, even if the latter have much more honey. On this account it is important to ascertain the number of bees, and to make your standing stocks as strong as possible, to maintain sufficient heat in the hives.

Feeding.

Whatever food is required must be given now, as bees should not on any account be fed in winter. Those who have not the convenience of the feeding-pans for the top of the hive, should provide little hollow troughs made of

elder, or a split bamboo stopped at the ends. These must be filled with honey or syrup, and then pushed into the mouth of the hive at sunset, the entrance being carefully closed, to prevent other bees from entering. Feeding should not take place in the daytime, as the hive will then be subject to the depredations of wasps and robber-bees, which are attracted by the scent, and not unfrequently devour the whole of the honey. In the morning, a little before sunrise, remove the troughs. Continue this operation nightly until you are sure your bees have sufficient winter provision. Do not be stingy: as we have said before, you will reap the profit of liberality to your bees in the rich return they will make.

Fumigation.

As some persons profess to have a difficulty in procuring the fumigating fungus, we may just say that the substance called German tinder, used by cigar smokers, or tobacco-leaves wrapped in brown paper, will answer almost as well.

If bees be kept exposed to the cold after fumigation, they will surely die; but in a warm room there is no danger of this. If they appear to you to have had an over-dose, and you find many apparently dead on the following morning, they may be recovered by placing them in the sun, or by any gradual application of warmth. After being drowned for twenty-four hours, and dried and warmed in the sun, bees will recover; even the fumes of brimstone do not always kill them. It was by the reviving of some, half-smothered in this manner, that the above more merciful plan was thought of.

If any drones are observed about the mouths of the hives as late in the season as the present month, it is more than probable that some defect exists within; and it would be well to select such stocks for union with others.

Close the entrance of your hives, only leaving room for

one bee to pass at a time. Protect them from the weather; a good straw hackle may do very well for the winter, but a red pan turned down upon the hive is better.

Directions for extracting the Honey and Wax from the Combs.

Remove your combs into a room where the bees cannot enter, otherwise so many will be attracted by the scent, as to interfere with your operations. Clean the combs carefully from all refuse, then cut them in slices, and lay them on wires or small sticks placed over a pan, that they may drain. The honey which runs in this manner is the best. After all the honey that will flow has come away, wrap the combs in a clean cloth, and squeeze out as much as possible into another pan. This honey will be of an inferior quality to the other. The combs, cloths, and other materials used in the separation, may then be placed near your hives, and the bees will carefully collect all that remains.

Afterwards put the combs into a clean saucepan, with as much soft water as may be necessary to prevent the wax from burning. Place the saucepan over a slow fire, and stir occasionally until the wax is quite melted. Strain through a fine canvas bag into a tub of cold water. You will have to squeeze the bag between two boards to force the wax through; it will fall into the water, and form thin flakes on the surface. Then collect the wax, put it again into the saucepan made quite clean, with a little water, melt it again very carefully over a slow fire as before, and take off the scum as it rises. When sufficiently melted, pour it into wetted saucers or other moulds, and set it by, where it may cool very slowly, or it will be full of cracks.

OCTOBER.

Feeding, and preserving from Dampness.

This month it will be advisable to ascertain if your stocks have sufficient food for winter; if they have not, still continue to feed them as they require, and the weather permits.

Guard against dampness; it is this more than all else that will destroy your bees. The damp of the weather outside the hive may be kept away by suitable protection, but it is the damp inside, caused by the condensation of the moisture from the breath of the bees, which does the mischief. Just as the wet collects and trickles down the walls or windows of a room in which a number of persons are assembled, so does it form in a hive, and more so in winter when there is but little evaporation.

An equal temperature within and without the hive would best prevent condensation. Do not think, therefore, of keeping your bees warm.

Housing in Winter.

The best place for bees in winter is a dry, cold, and dark room, or outhouse.

Put your bees there the last week of November, and let them sleep quietly till the flowers begin to come out at the end of February. Set their bottom-board slanting, that all the wet may run out at the door; or, still better, hang the hives in a coarse cloth. This will let in the air, and let out the moisture. In the spring you will find the bees kept in this way much stronger, as well as heavier, than any you leave on their summer stands. If you have no such room or outhouse, at least keep the sun away from them, or put them on the north side of your house, if the place is dry.

DOMESTIC FOWLS.

CHAPTER XII.

The Cochin China—Malays—Spanish fowls—Polands—Dorkings—Hamburghs—On the choice of stock—General management—Food—Hatching and rearing—Best times for hatching—Treatment of chicks—Produce and profit of fowls.

THERE are many varieties of fowls; some of these are not generally suited to the cottager, either because they are delicate in constitution, uncertain layers, bad mothers, or voracious feeders.

The Cochin China.

Within a few years, the Cochin China breed has been introduced into this country from that part of China called Shanghae; and though there has been a great rage for them, on account of their large size, extraordinary appearance, and many good qualities, they are ceasing to be favourites. Prices sufficient to buy a good cow or horse were frequently paid for a pair of birds of this kind. The cock frequently weighs from ten to fifteen pounds, the hen from seven to ten; the former stands two feet high, and the hen from eighteen to twenty-two inches.

The eggs, though often weighing from two to three ounces, are on an average very small compared with the size of the bird; and the hens have such a disposition to hatch that they do not produce as many eggs as some other breeds do. The Spanish, for instance, is far preferable as layers, for they go on laying, show no dis-

position to hatch, and require ordinary hens to brood for them. The Cochins have the hatching-fever frequently; I had one of these birds myself, which passed an entire month under its influence, and the season was too much advanced to give her the third hatch of eggs for that year. They are such excellent mothers and steady setters that they are well suited for bringing out choice broods of any variety, except that from their weight and awkwardness in getting in and out of the nest they are apt to crush the little chicks when nestling under them. There is, however, this decided defect in them, that they are not only yellow, but tough and stringy for the table after six or seven months, and also they are subject to apoplexy, and ailments of the digestive organs, which obliged me to kill three or four out of a very moderate number.

Some mongrels proceeding from this breed, and which are often supposed to be Cochins by their ignorant owners, are frightful in appearance.

Malays.

The Malays are related to the Cochins, at least inasmuch as they are supposed to have come from the same Asiatic stock. They cannot be preferred to the Cochins, or indeed to any other breed for general purposes. Their length of body and legs renders them unfit for hatching, and undesirable for the table, and they are very liable to suffer, when young, and therefore badly feathered, from cold or rain; and the flesh, like that of the Cochin, is stringy without being so richly flavoured. If to be reared at all, they should not be hatched before the commencement of summer heat, nor late in the season, for they require a dry and warm temperature more than any other breed. They also require the best nourishment, from their very tall form and slowness of growth. For these reasons, and their unfitness to bear close con-

finement, they are not suited to the cottager, who must look to something more than showy plumage, which the Malay bird certainly possesses.

Spanish Fowls.

These are not originally from Spain, as their name would lead one to suppose, but brought into that country either from the East or West Indies. We have had them long in England, but the original fine stock has met with a great many crosses: there are black and white kinds, and other tribes descended from them. A full-grown Spanish cock ought to weigh seven pounds, and a hen six. They merit the character of everlasting layers, and any cross from them is good for the common poultry-keeper on account of this quality. Hens which, with warmth and good feeding, will lay through the whole year are valuable: of course, a prudent person will fatten and kill only the male birds, and reserve the females as long as they continue to be good layers; and these will produce in the weight of eggs, though perhaps not in the number, quite as much as the Cochins. The pullets begin to lay when six or seven months old, so also do the Cochins, if well fed and treated.

Other hens must be provided, however, to hatch their eggs, as they do not like to do this themselves, perhaps because their legs are rather too long for the position of a sitting hen.

Mr. Bond, a Yorkshire gentleman, says of them:—"Their eggs are as good, if not better, than those of any other fowls, and though not so frequently laid in winter, as in the case of the Cochins, the size of those they do lay is a set-off on the other hand, besides the consideration that they do not lose time in their desire of brooding."

Believing that they will lay a greater weight of eggs in the year than any other fowl, he thinks them on this account the best suited to the wants of the farmer and

cottager who has opportunities for the sale of eggs. He does not admit that there is any inferiority in their flesh for the table; on the contrary, he says that some consider them as very superior in this respect. They are not so domestic as the Cochins, but will not ramble much from home if well fed; nor are they quarrelsome among themselves.

All this is no small praise.

Polands.

Of these there are two varieties, the one black, with a top-knot of white feathers; the other gold-coloured and spotted, with a dark-feathered crest. The plumage is not so abundant as that of most others; their legs are short, their bodies are plump, and, next to the Game Fowl, they are considered to be the most beautiful in appearance. The flesh resembles that of the Dorking, being rich and juicy. These fowls have the least desire of any to sit; and from the greater number of eggs which they lay, they are the most valuable, and have been called "Every-day Hens," or "Everlasting Layers." Their eggs are scarcely so large as those of common hens; but from the great quantity they produce, and their little tendency to sit, they are the most profitable of all the varieties. They are, however, delicate when young, especially between the second and the sixth month.

Dorkings.

These take their name from the town of Dorking, in Surrey, where they can be seen in the greatest abundance, and are said to have been first brought thither by the Romans. This fowl is the third in size of British poultry, and has a finely-shaped body and small legs. The colour of the hen is entirely white or mottled; the cock has beautifully varied plumage; and the breed may generally be distinguished by having five claws on each foot; one

of which, however, is usually imperfect. The colour of the flesh is not so white as that of some of the common kinds, but inclines to cream-colour; it is, however, of fine flavour. The eggs are large, and this fowl is an abundant layer. They especially thrive well amongst dry, chalky soils. Perhaps it may be true of all short-legged fowls, that they are not so well suited to damp, clayey soils as those with long legs, serving as stilts to keep their bodies above the wet ground. Take them altogether, if I were confined to choose one breed, I should select the Dorkings, with suitable soil and climate. The hens are good mothers and layers, and from their good form easily fattened. They are such constant sitters, and such good nurses to their broods, that they are often employed in hatching the eggs of other poultry,—such as the Spanish, Polish, and Hamburghs, and sometimes those of ducks.

Silver Hamburghs.

This is a capital breed for a cottager who wants a number of eggs without regard to size.

The Silver Hamburghs are known by many names,—"Dutch," "Every-day Layers," "Bolton Greys." Some of them are silver-pencilled, some spangled with black. By whatever name they are known, they are excellent little fowls, and easily kept. They are very short in the legs, plump in the make, and lay at a very early age.

The cock is a most bold, impudent little bird. I had one who, when only four months old, used to beat a Cochin cockerel two months older than himself, and three times his size and weight. They are very lively and active. The hen is very beautiful, and just the sort to be kept as a pet. She seldom sits, and lays her little eggs frequently, and for a very long time.

The Gold-spangled Hamburghs are fancy birds of great beauty, and more uncommon. Lancashire is remarkable for the Hamburghs of all kinds.

I have here enumerated only the principal choice

varieties of fowls which are bred in this country: but besides these, there are many other kinds, which have been produced by the continual crossing of the breeds: some sorts are peculiar to certain localities, which appear to be favourable to them; and some common farmyard fowl possess the diversified characteristics of all those we have described; some are good layers, others good sitters, or valuable for their flesh; and therefore persons who are inexperienced in such matters, and wish to avail themselves of the advantage of keeping fowls, must trust to the judgment and honesty of those from whom they purchase, as to the required qualities.

On the Choice of Stock.

No fixed rule can be adopted in the selection of ordinary fowls, experience showing that it is impossible to infer which individuals among a number of young hens will be good layers or good sitters. No dependence can be placed in the colour or form of the farmyard fowl by which to judge of these qualities. We may, however, say, that those which more nearly resemble in appearance any of the select varieties we have enumerated, will have similar characteristics. Thus the long-legged kinds are not very useful as sitters, as they do not cover the eggs so well as the other kinds; they are, besides, apt to trample and break them. But it does not follow, that because the form of the hen precludes her sitting well, she has no desire to do so; for we as often find the propensity as strong in the long-legged as among the short-legged breeds.

The following general directions, from Main's work on poultry, may be found useful:—"The races of hens which should be bred in preference to others, are those which yield eggs in the greatest abundance, and whose flesh is the most delicate; those two advantages, and especially the first, are blended in the common hens. In selecting them, they must be chosen of a middling size, of a black

or brown colour, a robust constitution, having a large head, sharp eyes, the comb pendent, the feet bluish; those with large spurs, which scratch, which crow, and call in the same manner as cocks, must be rejected."

A friend, who has considerable knowledge on this subject, has furnished us with his views as to the sort of hens most suitable to be chosen. "In my own experience," he says, "I have found the following characteristics worthy of being kept in view; viz., a good middle size, with black or bluish legs of proportionate length; the comb what is called 'double,' regularly formed, and well filled up; the head small, the eyes black and lively, the abdomen pendent, large, and much expanded, the feathers thickly set, 'close,' and smooth,—the colour dark or pale ground, thickly studded with well-defined dark-coloured spots and bars. A hen, with all or most of these marks, will generally be found an excellent layer, and may be termed both good and good-looking."

The fowls with large round top-knots, showing a descent from, or at least a mixture of the "Poland," are generally very good layers.

After all that may be said, observation and experience alone will determine the value of the hen; and the best way to arrive at any definite conclusion, will be to keep memorandums of everything connected with the fowls, as to their form, colour, age, produce, &c. Such a plan, carefully followed, would no doubt lead to very satisfactory results.

It is of no less importance to be careful in the choice of the cock than of the hen; he should be of moderate size, carry his head high, have a lively appearance, a clear voice, a fine red glossy comb and wattles, a broad well-expanded breast, and be strong in the wing, and of dark plumage. The legs should be thick, the claws sharp, the bill short, and he must be quick and energetic in all his actions.

When the cock takes a violent dislike to one or more particular hens, these must be removed, otherwise they

will be perpetually worried and harassed, and obliged to mope about in corners, and will always be subject to be torn or maimed by the cock.

There is a diversity of opinion as to the number of hens to be allowed to one cock. Mowbray says from four to six, the latter being the extreme number, with the view of making the utmost advantage. Ten, and even twelve hens have been formerly allowed to one cock; but the produce of prolific eggs under such an arrangement will seldom equal that to be obtained from the smaller number of hens.

Other writers variously state the number of hens most desirable, to be varying from five to twenty-five. But the object in view must always be regarded; for if the eggs be intended for hatching, one cock to six or seven hens will be necessary, in order to produce strong and healthy broods, while twenty hens may be allowed when chickens are not required.

General Management.

To insure success, and to realize profit in the breeding of fowls, it is absolutely necessary that the nature of the soil on which they are kept be of a thoroughly dry character. Damp clayey soils are highly injurious, as in such situations the fowls will be affected with asthma, diarrhœa, and other diseases, which produce great mortality among them. On the other hand, in a dry and warm situation, they will thrive with scarcely any trouble or attention.

Observe the difference between fowls kept in close damp streets in large towns, and those which have the advantages of light, air, and sunshine.

The same conditions we choose for ourselves, are those best adapted for fowls; viz., air, light, warmth and dryness: with all these circumstances, there need be no fear of failure. To insure these, let the yard in which

the fowls are kept be well drained and gravelled, so that there may be no collections of refuse matters, or stagnant water to produce disease, and that it will soon become dry after rain.

If possible, the poultry-houses should have a southern aspect; any out-house or shed may be rendered suitable, especially if adjoining to the dwelling-house, where the warmth from the fires at the back of the wall may serve to warm the building. This will be found very advantageous to the fowls; for as they are originally natives of warm climates, an increased temperature is always favourable to their laying, and for the rearing of young chickens. Precautions must be taken to keep out the rains, and the keen blasts of winter; and during the continuance of unfavourable weather, the fowls must be kept shut up in their house, as rain is so injurious to them that their laying will be retarded for a long period by a thorough wetting.

The floor of the fowl-house should be formed of chalk and earth, thoroughly beaten down to form a compact solid mass, which the fowls cannot tear up, and which will bear frequent sweepings. This floor should constantly be kept clean, and well sprinkled with sand or dry ashes, and there should also be several holes filled with either of these materials, for the fowls to tumble in, as they are accustomed to do, in order to rid themselves of the vermin with which they would otherwise be infested. "A better remedy, and one far speedier and of more certain efficacy, has been discovered at Windsor by her Majesty's feeder. The laying-nests, at Windsor are composed of dry heather and small branches of hawthorn, covered over with white lichen. These materials, rubbed together by the pressure and motion of the hen, emit a light powder, which, making its way between the feathers to the skin, is found to have the effect of dislodging every species of troublesome parasite."

The perches for the fowls to roost on, should not be placed one above the other for obvious reasons, but in a

continuous line around the house. Pegs driven into the wall may serve as steps for the fowls to ascend to roost, but they must be so fixed as to form a proper slope for the purpose.

The nests for laying are recommended by some to be formed in boxes or baskets, arranged around the room, either upon the floor or at any height that may be convenient. Clean straw is preferable to hay for nests, as being less liable to harbour vermin or become musty.

But the best form is a box with a side entrance, as the hen is not so liable to break the eggs as when she jumps downwards upon them. The more secluded the nest can be placed the better, as the hen is often fastidious and prudish about her laying.

The two or three eggs first laid should be left in the nests for a few days; afterwards chalk eggs will serve the purpose of nest eggs.

After the fowls have gone out, the door and window of the house should be opened, and occasionally a small quantity of hay should be burned in it to renew the air, and to destroy noxious insects. The nests, perches, food-troughs, &c., should be frequently scraped and washed, and the ground often swept, scraped, and covered with ashes.

Food.

Nature teaches the fowl the kind of food most suitable; and in this, as in all other matters, if we follow nature, we shall do much better than by adopting the notions of those persons who recommend the most extraordinary compounds as food for fowls. "They are of all birds the most easy to feed; nothing is lost to them, they are seen the whole day long, incessantly busied in scratching, searching, and picking up a living. The finest, the most imperceptible seed, cannot escape the piercing look of a fowl: the fly, that is most rapid in its flight,

cannot screen itself from the promptitude with which she darts her bill; the worm which comes to breathe at the surface of the earth, has not time to shrink from her glance, but is immediately seized. The food of fowls consists of several sorts of grain, fruit, insects, and worms. A good way to rid the gardens of caterpillars, worms, and other little creatures that eat up the produce, would be to let in hens, if by their habit of scratching the ground they did not cause more damage than service. Dressed or raw flesh is likewise suited to the taste of these birds; and they are very fond of mulberries and some other fruits.

"Fowls that feast on seeds, worms, insects, with everything they have found on the dunghill, in the yards, in the barns, in the stables, only want at the farms, in spring and winter, a regular feed early in the morning, and in the evening before sunset."

Barley is the best general corn for fowls, and it should be the general food of hatching hens more particularly. Oats are not so good, besides they are apt to scour young chickens. They are recommended by some as promoting laying especially; but any corn is welcome to fowls, and even potatoes, if given in a warm state, are quite sufficient for them, as the Irish peasantry know by experience.

Maize, or Indian corn, is an excellent article of food. For either the ordinary keep, or for fattening fowls, it should be given whole, or slightly bruised, and will be found more profitable than any other bought grain. Sunflower-seed has been much praised as food for poultry; it may be used economically in connection with other food, to the saving of grain. The head of the flower, containing the ripe seed, may be cut off and thrown to the fowls: picking out the seeds serves for their amusement.

To keep fowls in health, they should be supplied with a sufficiency of vegetable diet, such as cabbage, lettuce, beet, carrots, potatoes, &c., either raw or boiled. In the winter, too, when they cannot procure worms or insects,

it is very good to give them small quantities of animal food, odd bits of meat, chopped small; or bones may be given to them to pick, which will be of great service in forwarding their laying.

I know a farmer who keeps about a hundred barn-door fowls, and he collects carrion for them to promote laying, when insects and worms are scarce in the pasture-fields.

Instinct causes the fowl to swallow small gravel stones and other hard substances, which are taken into the gizzard, and assist digestion by grinding the food. There should always be a good supply of gravel and pounded bricks for them to resort to.

The egg-shell being principally composed of lime, it is important that laying hens should have access to substances containing lime, such as broken plaster and old lime-mortar, otherwise they will not lay so plentifully, and many of the eggs will be soft, that is, without shell: this must be particularly attended to in winter, when snow is on the ground, and at other seasons when they may be prevented from going abroad.

Hatching and Rearing.

The eggs should not be more than three weeks laid, for fresh eggs produce the healthiest chickens and the easiest to be hatched. Select eggs of the fertility of which you are certain: those of your own good hens, not exceeding two years old, are most to be depended upon, if you have been careful to allow but five or six hens to one cock.

When the eggs are chosen, put them, while fresh, in clean sawdust in a dry place until the time for setting them.

The number given to a hen should be in proportion to her size and ability to cover them. As a general rule, a hen will cover from eleven to thirteen eggs of the size of her own; more, however, may be given in summer than in

winter. A hen that will hatch thirteen in May or June, ought not to have more than nine or eleven in February or March.

The desire of most hens to brood when they have finished laying about the due number for one hatching is very powerful. But it is not enough that they should appear desirous to do this, as it often happens that hens will commence incubation and then forsake their nests, after sitting on the eggs just long enough to addle them. Those most likely to perform the service best are at least two years old, not easily frightened, having large wings, being well feathered, plump, and, above all, with short legs, so that they may sit close.

They show their desire to sit by making a clucking noise, and by a general restlessness and state of fever: this is so strong in some hens that it cannot be overcome without cruelty; therefore it is better to indulge the longing by giving eggs to them. I had once remarkable experience of the uselessness and bad economy of refusing eggs even to pullets anxious to sit. Two half-bred young hens, between Dorkings and Cochins, had brought out two broods each, in the earlier seasons, and after nursing them very attentively, began to lay for the third time, in August. After producing about a dozen each, they began to sit at the end of the month, in corners which suited their fancy. There they sat, day after day, in spite of every attempt to disturb them: they were imprisoned in coops, left in darkness, physicked, and even soused in cold water. This barbarous treatment was continued until the middle of October. If they had been allowed to follow their natural instincts, I should have been counting my chickens before the end of September, and about Christmas they would have brought high prices. Though I had always before been opposed to the practice of encouraging or allowing hens to hatch more than two broods in the year, the above case led me to think that the natural desire when strongly manifested should not be thwarted.

To test the steadiness of a hen, she may be placed for a few days on some worthless eggs: if she perseveres, and there is therefore reason to have confidence in her, remove those eggs, and give her proper ones.

Some hens sit so constantly that it is necessary to raise them from their nests and feed them: barley (or oats) and water should be placed, however, always near them, in order that they may take nourishment at any time, if prompted by hunger to do so. Some hens will not bear to be handled, and are so violent and passionate if disturbed, and so ready to forsake the nests, that they should be left to their own instincts. They will take food or water when disposed to do so; that they should, however, take corn heartily at least every second day is very desirable, to maintain due heat in the body, on which the successfulness of hatching so much depends. Solitude and quietness are absolutely necessary for a hen while on her nest.

Best times for Hatching.

Spring and autumn are the most favourable seasons for hatching: eggs are then most plentiful and in best condition, and the temperature of the air is propitious.

Eggs should not be disturbed after they are in the nest: experiments prove that it is worse than useless to turn them; the hen knows best what to do with them.

On the twenty-first day the hatching of fowls is usually accomplished; the chicks then peck through the shell, and free themselves from their prison. No attempt should be made to break the shell and liberate them before their full time, though assistance is sometimes necessary, as when some chicks may be too weak to free themselves. Sometimes there is a delay of a day or two, from coldness of weather, want of heat in the mother,

and weakness in the imprisoned chick; and it is better not to be too hasty in meddling with the shells.

The chicks should not be handled at all or removed from the warmth of the mother for twenty-four hours; they do not require food for at least this space of time; if, however, the whole brood is not hatched soon afterwards, it may be necessary to take away those that have first come into the world, and give them a few crumbs of the yoke of a hard-boiled egg, or crumbs of stale bread, and then return them to their mother. It is sometimes necessary to remove the first chicks and place them in a basket, bedded with wool, near a fire. The effect of warmth on them is surprising.

Treatment of Chicks.

After crumbs of bread and egg, oatmeal or barley-meal, slightly moistened with new milk or water, and curd chopped small, for some days. The very small tailings of wheat are the best food for them afterwards until they are old enough to swallow and digest larger corn.

When the whole brood are hatched, the usual method is to place them with their mother for some days under a coop in a retired place, and with food and water outside the bars, so that the chicks may run in and out at pleasure. If the hen were free too soon, she would take the chicks prematurely into places unfit for them, and half-blind them with the dust she would raise, when rolling herself in it and scratching violently, according to the habits of fowls. After a week or so, she may, however, be allowed to walk about with her brood under precautions.

Chicks should be cautiously guarded from showers or heavy dew upon grass; therefore they should not be allowed to go out early in the morning.

Produce and Profit of Fowls.

On this head we quote from Cobbett's "Cottage Economy." "When fowls can be kept conveniently about a cottage, three, four, or half a dozen hens, to lay in winter, when the wife is at home the greater part of the time, are worth attention. They would require but little room, might be bought in November and sold in April, and six of them, with proper care, might be made to clear every week the price of a gallon of flour. If the labour were great, I should not think of it; but it is none; and I am for neglecting nothing in the way of pains in order to insure a hot dinner every day in winter, when the man comes home from work."

Eggs are usually sold at such prices as to place them beyond the means of many families as ordinary articles of food. But this need not be, for almost any one can, without much trouble or expense, have a constant supply of new-laid eggs, even during the winter, when they are most valuable.

If you have a convenient out-house, put into it, in October, a dozen hens and a cock. Let this place be kept warm and perfectly dry. With an abundant and constant supply of food, these fowls ought to yield six eggs daily on an average, worth three shillings and sixpence a week. The cost of food, *if bought*, and if the hens be in confinement, and therefore unable to find their own subsistence, will no doubt be so heavy as to render profit very questionable. Admitting some of the calculations made upon the subject to be correct, the cost of the corn would be about four pounds in the year, the profits would be about five pounds; no deduction being estimated for management, which is assumed to be a pleasurable occupation.

An American gives a curious report of his treatment of laying hens:—

"Hens will lay eggs perpetually if treated in the fol-

lowing manner: keep no cocks, give the hens fresh meat, chopped up like sausage-meat, once a day—a very small portion, say half an ounce a day to each hen—during the winter, or from the time insects disappear in the fall time, till they appear again in the spring. Never allow any eggs to remain in the nest for what are called nest-eggs. When the roosters do not run with the hens, and no nest-eggs are left in the nest, the hens will not cease laying after the production of twelve or fifteen eggs, as they always do when roosters and nest-eggs are allowed, but continue laying perpetually. My hens lay all the winter, each from seventy-five to one hundred eggs in succession. If the above plan were generally followed, eggs would be just as plentiful in winter as they are in summer. The only reason why hens do not lay in winter as freely as in summer is the want of animal food, which they get in summer in abundance, in the form of insects. I have for several winters reduced my theory to practice, and proved its entire correctness."

The breeding and fattening of fowls for the market is a profitable occupation; there is always a great demand for young fatted fowls, which realize prices proportionate to the difficulty with which they are usually obtained; five shillings a couple is considered a very moderate price. Mowbray says, "Twenty dozen fowls were purchased at Wokingham, in Berks, for one gala at Windsor, after the rate of half a guinea the couple. At some seasons fifteen shillings have been paid for a couple."

The cost of breeding and fattening one hundred chickens cannot exceed five pounds, and if they are sold to the retailer at two-thirds of the market price, a profit, varying in accordance with that price, from fifty to a hundred per cent. would arise to the producer.

We will take up the remarks of Richardson as to the profit to be derived from eggs. "Some very interesting experiments, relative to the production of eggs, were

made about ten years ago, by Mr. Mourt, of Stoke, near Guildford. He obtained three pullets of the Polish breed, on the 1st of December, 1835, which had been hatched in June previous, and they commenced laying on the 15th of the same month. They laid from the 1st of December, 1835, to the 1st of December, 1836, between them, the number of 524. During the year they consumed three bushels of barley, seventeen pounds of rice, and a small portion of barley-meal and peas; the cost of which amounted to about 16*s.* 10*d.* The number of eggs being 524, gives about thirty-one eggs per every shilling expended; and assuming the weight of each egg to be one and a quarter ounce, we have a result of forty-one pounds of the most nutritious food that can possibly be procured, at the low cost of 4½*d.* per pound; or if the eggs were, instead of being consumed, sold to the retailer, a profit of about 100 per cent. would have accrued to the producer."

"Out of seventy-two million eggs annually imported into England from France, Germany, the Netherlands, and other countries, France contributes fifty-five millions. Calculating the first cost at 4½*d.* per dozen, England pays annually to France for eggs about £77,000."

It will surely be worth while for the cottagers and other industrious classes of this country to endeavour to carry out in practice the instructions we have given for poultry management, and thereby be enabled to supply the constant demand for home consumption both of eggs and chickens. By doing this they will realize considerable profit, add to their individual comfort, and increase their independence.

With some trifling alterations, I use the words of a writer before quoted: "If only one person in every district exerted himself to disseminate among his humbler neighbours such knowledge as I have endeavoured to convey in the course of this article, they would treble the amount of their gains; nor need selfishness interfere with the good work—there would be an abundant market for

all. Let landlords only give a little advice and encouragement to their poorer tenantry; let them furnish each townland with a good Spanish or Dorking cock, or a brace of them, and let them give to such as deserve it, either by industry or some other description of merit, a few good eggs, and they will diffuse much benefit at a trifling cost."

GEESE.

CHAPTER XIII.

Breeding stock—Laying—Hatching—Feeding—Plucking—Diseases.

LIKE the domestic fowl, the tame goose has been celebrated from remote antiquity. The cackling of geese saved the Capitol of Rome from destruction when the city was taken and pillaged by the Gauls. The custom of eating roast goose on Michaelmas-day arose from the circumstance of Queen Elizabeth having one on her table when she heard of the scattering of the Spanish Armada.

The common goose scarcely needs description, it is to be seen almost anywhere in the country. It is usually white and grey mixed, sometimes quite white, especially among the males. The mixed, or party-coloured, is supposed to be less vagrant in its habits than the grey goose, and the feathers are more valuable; but the latter is more prolific, and produces the finest young ones. The gander should be pure white, and of a large size.

Breeding Stock.

A single breeding stock consists of a gander and five geese; these are enough for an ordinary farm-yard, as they will produce forty or fifty young in the season. They may be lodged in almost any common place or out-house; they are fond, however, of a clean and dry spot in which to pass the night; and attention to provide

them with plenty of fresh straw preserves them from vermin, and improves their health and condition.

It is not absolutely needful to have a pond for them; many persons keep geese successfully who have not this advantage; yet if there should be a pond or stream in their vicinity, it will be of benefit to them, as affording them the means of gratifying the instinct of their nature. Abundance of clean water must be provided when there is no river or pond near. Persons whose premises are confined cannot profitably keep geese for breeding, as a meadow or common is necessary for them to range in, from which to procure the greater part of their food; for if it be necessary to buy food for them, no profit will be obtained.

To have early broods is advantageous, that the young geese may be full-grown when the season arrives for disposing of them; and also because a second brood may then sometimes be obtained in the same year. The Chinese geese, which have been introduced into this country for many years, commence laying in November, and in mild seasons the goslings are hatched in January, which, if kept warm and dry and well fed, are ready for the spit in May.

Laying.

The laying of geese may be hastened by feeding them well all through the winter upon good solid corn. They commence laying usually in the beginning of February. An egg is laid every alternate day, or, if the weather be warm, two in three days, until ten or twelve are produced. If removed as soon as they have been deposited in the nest, the goose will continue to lay for a much longer period, or until there are from twenty to thirty eggs; and at harvest-time she will begin to lay again, and probably produce as many more. Instances are on record of geese producing seventy, and even one hundred, eggs in a year.

The time of laying may be known by the goose carry-

ing straws to form her nest; when this is seen, a nest of straw, lined with soft hay, should be prepared in the place intended for her nest: nettles strewed around are said to attract her to any desired spot. Food and water must be placed near the nest, and when one egg is laid, she will continue to lay in the same place. The number of eggs usually allowed is eleven; but more may be given if the goose be able to cover them. If she should want to sit after laying only a few eggs, she must be prevented until a sufficient number is ready for her. Where many geese are kept, the desired number may be made up from the nests of others. Goose-eggs may be hatched under a hen; but four or five are as many as she will be able to keep warm. Turkey-hens are kept in some parts of France for sitting on goose-eggs; they are able to cover fifteen or sixteen of these.

Hatching.

While the goose is sitting, food and water should be placed near her nest, that she may not be obliged to quit it for any length of time, and thereby render the eggs cold and addled. No harm will arrive from the gander being allowed to be near; he seems to watch with interest for the time when the young shall be hatched. About the thirtieth day the eggs will begin to be hatched: as the young come forth irregularly, those first produced must be removed, if the goose will allow it, and kept warm before a fire, and replaced with her when the whole are hatched.

In Lincolnshire the practice of breaking the shell to let out the gosling is resorted to,—perhaps with less danger than attends the breaking of hens' eggs for the same purpose.

Feeding.

The goslings should not be fed for twelve hours. If the weather be warm, they may, after two days, be turned

out into the open air, care being taken that they do not go out too early in the morning, or remain out too late, and that they be sheltered from the wind and rain; they must also be prevented from going into the water until they are a week or more old, as they are very liable to the cramp. Their food may be either warm bread and milk, or thin barley-meal and water, curdled milk with lettuce-leaves, and the plant called *goosegrass* or *cliver*, which grows so plentifully in early spring, and of which they are very fond.

After a few days they may be allowed to go abroad with the parent, but care must be taken to destroy all nightshade, hemlock, and henbane, that may be growing near their haunts, as they will eat these things and poison themselves. When they have a common to range over, and a pond to frequent, they will require but little feeding; vegetables from the garden should be freely thrown to them, but beyond this, they will get their own living, if it be inconvenient to assist them in this respect.

There are very many processes and different kinds of food recommended for fattening geese, some of them expensive and others unnecessary, as an over-fattened goose is anything but a delicacy.

"Geese are generally eaten at the age when they are called green geese, or after they have got their full and entire growth, which is not until the latter part of October. Green geese are tasteless squabs; loose, flabby things; no rich taste in them; and, in short, a very indifferent sort of dish. The full-grown goose has solidity in it; but it is *hard* as well as solid, and in place of being *rich*, it is strong. Now there is a middle course to take. For three years, including the present year, I have had the finest geese that I ever saw or heard of. I have bought from twenty to thirty every one of these years. I buy them off the common late in June or very early in July. They have cost me from two shillings to three shillings each, first purchase. I bring the flock

home and put them in a pen, about twenty feet square, where I keep them well littered with straw, so as for them not to get filthy. They have one trough in which I give them dry oats, and they have another trough where they have constantly plenty of clean water. Besides these, we give them two or three times a day a parcel of lettuces out of the garden. We give them such as are going to seed generally, but the better the lettuces are, the better the geese. If we have not lettuces to spare, we give them cabbages, either loaved or unloaved; though, observe, the white cabbage as well as the white lettuce, that is to say, the loaved cabbage or lettuce, are a great deal better than those that are not loaved. This is the food of my geese. They thrive exceedingly upon this food. After we have had the flock about ten days, we begin to kill, and we proceed once or twice a week till about the middle of October, sometimes later. A great number of persons who have eaten of these geese, have all declared that they did not imagine that a goose could be brought to be so good a bird. I should think that the cabbages or lettuces perform half the work of keeping and fattening my geese; and these are things that really cost nothing. I should think that the geese, upon an average, do not consume more than a shilling's worth of oats each; so that we have these beautiful geese for about four shillings each. No money will buy me such a goose in London; but the thing that I can get nearest to it will cost me seven shillings. Every gentleman has a garden. That garden has, in the month of July, a waggon-load at least of lettuces and cabbages to throw away. Nothing is attended with so little trouble as these geese. There is hardly anybody near London that has not room for the purposes here mentioned."*

Geese will almost grow fat when turned into the stubble-fields after harvest, which is of great importance to the farmer.

* Cobbett's "Cottage Economy."

The profit on geese, from their flesh and feathers, and even their dung, may be an important consideration for the cottager who has a common near his dwelling, and a garden to supply them with vegetables. The price of feathers is about half a crown a pound.

Plucking.

Much barbarity has been said to be practised in plucking the living geese, in those localities where they are annually deprived of their feathers; from want of dexterity in the operator, many are so torn and mangled as to occasion their death; while the cold nights frequently carry off hundreds of the poor things which have been stripped of their warm plumage. No effectual remedy, for what appears to be almost an act of necessity, has, however, been proposed.

Diseases.

Geese are subject to diarrhœa or looseness: for this complaint, hot ale, in which acorns or bark has been boiled, may be given them. When they are attacked by giddiness, the remedy is bleeding, by pricking with a needle a vein which is under the skin that separates the claws. Insects get into the ears and nostrils of goslings, and are a dreadful annoyance to them; in such a case, give them barley at the bottom of a pan of water, so that when they plunge their heads to eat the barley, the insects will be destroyed, or fly away.

DUCKS.

CHAPTER XIV.

Varieties—Laying—Hatching—Feeding—Extraordinary deception.

Besides the common English duck, there is a very great variety of these birds, of which, however, only three kinds are usually found in our farm-yards; these are the Rhone or Rouen Duck, the Muscovy, and the White Aylesbury.

The Rhone is dark-coloured, of rather large size, but is now almost entirely bred in with the native kind. The Muscovy, so called, not from its country, but from the strong musky odour it emits, is much larger than the common duck; in length it sometimes exceeds two feet, and nearly three feet measured across the wings, when they are extended. A red patch covers each side of the head. Its colour in its native state is nearly black, shaded with shining green, with a stripe of white on the wings; and the bill and legs are red. It is considered profitable, from being more productive than others, and because it fattens very readily, but on account of its musky flavour, is generally discarded from the table. If, however, the glands near the tail, and the head be cut off as soon as the duck is killed, the disagreeable taste is removed, and the flesh somewhat resembles that of the wild duck.

The White Aylesbury is the most ornamental, as well as the most profitable, and, of course, is on these accounts to be preferred. It is very plentiful in Buck-

inghamshire, from whence vast quantities are sent to the London markets.

Among all the varieties, the drake is larger than the duck, and his colours are more striking and brilliant; he is also distinguished by a tuft of feathers turning upwards at the tail. One drake is sufficient for six ducks.

Laying.

February is the period when laying commences, and if not interrupted by hatching, from fifty to sixty eggs are produced. A duck is reported to have laid eighty-five eggs in as many successive days.

During the laying season, ducks must be well looked after, as they will deposit their eggs in any place where they may happen to be, sometimes even in the water. They are more difficult to keep in confinement than the goose, and there is more trouble in getting them to take to a nest, but as they usually lay in the night, or early in the morning, a little care in giving food near the place, and in preparing a nest will generally be sufficient, and when once accustomed to a nest, they seldom forsake it.

Hatching.

The anxiety of ducks for sitting is not generally so great as with domestic fowls, and it often happens that they remain so long away from the nest, that the eggs become chilled, and spoiled in consequence. Hence hens are sometimes used for hatching ducks' eggs, not only from sitting better, but also from being more careful mothers in leading the young brood *from*, rather than *to*, the water, which is injurious to them when very young.

The number of eggs given for a duck to hatch is from eleven to fifteen. The period of sitting is thirty-one days. If the eggs are not of the duck's own laying, they should be all of the same colour as her own, as she will sometimes turn out from her nest those of a different

shade, or those belonging to other ducks. During incubation or sitting, food must be placed beside her, and an opportunity may be sometimes afforded her of going into the water for a short period. The duck will often cover her eggs with hay or straw, or leaves, in order to prevent their growing cool in her absence.

There is no necessity for removing the young ducklings as they are hatched; they are hardy, and may be left to the care of the parent. In fine weather, as soon as all are hatched, they may be allowed to run on the grass, the mother being confined under a coop, with food made of oat or barley meal and water, near at hand.

Feeding.

In France, when the ducklings are a week or ten days old, they get mashed potatoes, bruised acorns, vegetables boiled, chopped up, and mixed with bran.

Very soon they may begin to eat almost anything, for ducks are so voracious, and so little particular as to kind or quality in their food, that any offal, however disgusting, seems not to come amiss to them. Thus Cobbett says, "A dead rat, three-parts rotten, is a feast for them." They seek their food ravenously, whether on land, in the water, or in mud; worms, slugs, snails, insects, caterpillars, &c. &c., are acceptable to them. Thus they are sometimes advantageously allowed to forage for themselves in gardens, where they effect good by destroying these creatures, in addition to finding a great portion of their food. On this account the duck is the least expensive kind of live stock for any one to keep, and may be turned to profitable account by those who have the room, and will take the necessary pains to rear them. Young ducks should not be allowed to eat too gluttonously of worms, or they will kill themselves in doing so.

It will not do to bring ducks to table if they have only been fed on such refuse food or garbage. In order to

fatten them, or to render their flesh delicate, it is necessary to give them good oats, plenty of clean fresh vegetables and water. Or, as they do abroad, cram them with paste made of buck-wheat, or ground malt, mixed with milk, for eight or ten days, which makes them fat and well-flavoured. Ducks may also be fattened upon acorns, of which they are very fond; the flesh is, however, not so tender or delicate as when fed by other means.

Cobbett again says—"I treat ducks precisely as I do my geese. I buy a troop when they are young, and put them in a pen, and feed them upon oats, cabbages, lettuces, and water, and have the place kept very clean. My ducks are, in consequence of this, a great deal more fine and delicate than any others I know anything of."

The feathers of ducks are not so valuable as those of the goose, but yet the profit to be derived from the eggs, the flesh, the feathers, and even from the dung, would be of considerable importance to the cottager, especially where there is the advantage of a free, open range, where there are ponds or marshes, or even a ditch, in which they can forage out food for themselves.

Extraordinary Deception.

We read in Anson's voyages of the following trick practised upon the crew of the *Centurion* by some Chinese at Macao:—These rogues sold live poultry for the ship's store by weight. One time a great number of fowls and ducks was bought in, and very quickly the greatest part of them died. This spread an alarm on board, it being feared that they had been killed by poison; but on examination, it appeared that it was owing to their being crammed with stones and gravel to increase their weight that the poor birds died. The ducks suffered most.

PIGEONS.

CHAPTER XV.

Varieties—Common dovecote pigeon—Keeping pigeons at other people's expense—Pigeon-house—Nests—Food and Water—Profits.

THIS extremely beautiful race of birds has been held in high estimation both in ancient and modern times, as well for the pleasing amusement they afford, as for the profit to be derived from them as articles of sale or of domestic consumption.

There are so many varieties of pigeons, that it will be scarcely worth while to enumerate them, it being more to the purpose to treat of those most useful to man, rather than of mere fancy breeds. There is no advantage in keeping the latter in preference to the common house or dovecote pigeon, although, if a certain market could be always found, it might be profitable to raise fancy pigeons for sale.

Those who intend to keep pigeons for gain will not trouble themselves about Carriers, Fan-tails, Pouters, Tumblers, &c., but confine their attention to the common pigeon, which has this recommendation, that it breeds oftenest, and attends best to its young.

Keeping pigeons at other People's Expense.

It has been said, that if pigeons be permitted to fly abroad to seek their food, little expense will be incurred for their keep, while the value of their young will be of some importance to the cottager. But this, although it

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may be a very cheap way to the owner of pigeons, would not be very honest; it would be keeping them at the expense of other people, for during the greater part of the year they are able to procure their food from the fields, or from the stacks in the farm-yard.

It may be, and indeed is very often said, that "the farmer will never miss what the pigeons take;" and thus, because the robbery appears to be but trifling, and will never be missed, no harm is seen in it. But real honesty asks not whether it is much or little that is taken, or whether the fact be known or unknown, but acts simply on the golden rule, "Do unto others as you would have others do unto you."

To prevent injustice to the tiller of the soil, those who keep pigeons should feed them regularly and abundantly, a mode which so attaches them to their home, that it is often difficult to get them to fly abroad even for air and exercise; it entirely prevents those frequent losses from straying and death by the gun, to which those who allow their pigeons to pilfer their neighbour's produce are so constantly subject.

Pigeon House.

When many pigeons are to be kept, the best place is an empty chamber or garret, if warm and dry, and where they can be open to observation. The space between the roof of a house and the ceiling of an upper chamber may be very well appropriated for this purpose. An opening should be made through the tiles or slates for the going in and out of the pigeons, with a cover resembling a dormer or garret window, in order to keep the wet out. This outlet should, if possible, face the south, or south-east, and be well-sheltered from cold, high winds, and heavy rain; because in any place much exposed to the weather, the growth of the young pigeons is delayed, and the health of the older ones sensibly affected.

Around the interior of the loft, a row of compartments for the pigeons should be fixed at any convenient height.

Shelves placed one above another at eighteen inches apart, and divided by partitions placed at the same distance from each other, then boarded up in front, leaving outlets for the pigeons, is the simplest plan that can be adopted. Any boy with a little ingenuity will be able to construct these apartments, as it is not necessary that any fixed plan should be followed; only care should be taken to allow height enough for fancy breeds, if they are kept, and eighteen inches will be quite sufficient for that purpose.

Nests.

Each pair of pigeons should have two nests, closely adjoining, yet separated from each other by a partition; for good breeders, generally at the same time they have young to attend to, have also to hatch eggs, and where there is no separation between the nests, the hen while sitting may be annoyed by the young birds, and compelled to quit her nest, so that the eggs will be broken or addled.

The pigeon lays two eggs and then sits; the eggs are hatched nearly at the same time, as she does not sit closely upon the first egg until the second is laid. The nest is of the rudest possible construction; a few sticks or straws laid across each other generally serve the purpose; often, indeed, pigeons do not take the trouble to make a nest at all, but lay their eggs upon the flat surface of the floor of their nests, in which case the eggs do not lie closely together during the progress of incubation, but are in danger of being broken by rolling on the ground. In Germany, to prevent this, straw nests are provided, something like the top of a beehive turned upside down; the eggs close together at the bottom, and receive equal warmth while hatching.

Food and Water.

Tares or small horse-beans, called "pigeons' beans," are the best, as well as the cheapest food for pigeons;

but peas, both grey and white, barley, wheat, hemp, and rape seeds, may be occasionally given with advantage. The food, of whatever kind, should be supplied twice a day, early in the morning and in the afternoon. On each occasion, just as much as the birds can eat should be given, so that there may be no waste by the scattering about of the grain, which is the case when this is always kept on the floor of the pigeon-house.

A constant supply of fresh water must be provided, not only for drink, but also that the pigeons may bathe themselves, which they frequently have occasion to do, in order to rid themselves of vermin. A large earthen pan will answer for both purposes, but the water ought to be often changed.

The floor of the pigeon-house should be strewed with fine gravel, which is as necessary and beneficial to the health of pigeons as it is to that of fowls. Lime rubbish sprinkled with salt and water is also beneficial. Pigeons are very fond of salt, and for this reason the "salt cat" is often introduced into the house: not a real pussy, but a composition of the following materials:—about a gallon each of gravel, earth, and old lime mortar; half a pound each of carraway, hemp, and mustard seeds; two or three ounces of bay salt, all being well mixed with strong brine, and then baked in a pan. When sufficiently dried, and become cold, it is to be placed upon the floor of the pigeon-house, where it will afford a constant source of enjoyment to the pigeons in picking out the seeds, besides contributing to keep them in health.

Profits.

It is very doubtful whether such large profits are to be realized by pigeon-keeping as some writers have maintained, who assert, that owing to the rapid and prodigious increase which the birds make, there is a vast gain to be derived. Most people who buy grain for pigeons find

the expense of their maintenance nearly equal to the profit, though the increase, under favourable circumstances, and without casualties (which are, however, constantly occurring), might be prodigiously great. Calculators (in imagination) have amused themselves in reckoning that in four years, from a single pair, fourteen thousand seven hundred and sixty birds may be produced.

Pigeon's dung is very valuable, constituting one of the most powerful manures, and if collected from the pigeon-house in considerable quantities, it would form an important item in the article of profit.

But, apart from the question of gain, there is a consideration in which all benevolent persons will concur with Cobbett. He says, "Pigeons are of this use: they are very pretty creatures, very interesting in their manners; they are an object of delight to children, and to give them the early habit of fondness for animals, and of setting a value on them, is a very great thing. A considerable part of the property of a nation consists of animals. Of course, a proportionate part of the cares and labours of a people appertains to the breeding and bringing to perfection those animals; and a labourer is of value in proportion as he is worthy of being entrusted with the care of animals. The most careless fellow cannot hurt a hedge or ditch; but to trust him with the team or the flock is another matter. And, mind, for the man to be trustworthy in this respect, the boy must have been in the habit of being kind and considerate towards animals; and nothing is so likely to give him that excellent habit, as his seeing from his very birth animals taken great care of, and treated with great kindness by his parents, and now and then having a little thing to call his own."

COTTAGE FARMER'S CALENDAR.

JANUARY.

I SHALL take for granted that every part of your field intended for cropping has been already dug deeply and roughly, and ribbed up to expose the greatest surface. On stiff land thus exposed, the action of the frost will be more useful in loosening it than weeks of labour. If water rests on the surface, this is a certain proof that draining is necessary; and until this be done, nothing can proceed profitably or with satisfaction to the cultivator;—drain, then, without delay.

This is a convenient time for cutting drains. These should be made from three to four feet deep, and from eighteen to twenty-four feet a part in thorough draining, according to the quality of the undersoil and the circumstances under which wetness affects the land. The old practice of running drains directly across or aslant the inclination of the land was wrong. Let the drains be in the direction of the slope.

Keep the mouths of all drains, ditches, and furrows free from lodgment of water, and for this purpose take care that your outfall is sufficiently below their level.

Trim and plash edges.

Plant thorn-quicks, after properly preparing the soil for them. Shorten the stems of the quicks to about six inches from the roots, and plant them either upright in the usual English way, on a strip of raised mould, or resting horizontally on a row of stones laid in the Irish manner for the ledge of a bank fence.

If the ground be hard, wheel out dung and the scourings of ditches for composts, and mix the materials as soon as possible.

Turn and mix composts that have been previously made. If you raise a dunghill in the field, cover it with some of the surrounding earth. This crust prevents the escape of the volatile substances of the dung.

You may make a very good compost without any dung —reserving this for the crops which must have putrescent manures, thus:—

Make a platform of sods or moulds six inches thick, twelve feet wide, and of any length. On this bed spread quick-lime about three inches thick. Let the lime be then not only slaked, but moistened well with a solution of salt, in the proportion at least of 7 lbs. of salt to half a hogshead of water, and pour this solution gradually and evenly on the lime accordingly as the lime imbibes it. Then spread a layer of mould over the slaked lime four or five inches thick, and over that again another course of lime, to be treated in the same manner, and so on, until you have accumulated a sufficient mass of compost.

If the soil of a headland be applied for this purpose, one or two courses of earth and lime will be more convenient. When the last layer of earth has been put on, let the whole be cut through and well mixed, in which state it should lie until a short time before it is to be used, when it should be turned again. The chemical combination of the salt and lime produces new properties of fertilization.

FEBRUARY.

Go on with your draining.

Spare no pains to collect manure, and let none of the urine from the cattle-sheds or dunghill be washed away by the rains which often fall so copiously during this month. A water-tight cask, sunk in the ground, will form an excellent substitute for a cistern.

Putrescent manures (those produced by animal and

vegetable substances combined) enrich the soil more than other manures.

In the southern parts of Great Britain and Ireland, the sowing of horse-beans proceeds during the course of this month, if the land be in a fit state.

The best mode of putting beans into the ground is by dibbling them, in rows of 16 or 18 inches apart, and at distances between the holes of 8 or 9 inches.. Dibbling is decidedly the most economical system for the cottager Put only three or four beans into each hole.

If your soil be dry and climate mild, you may sow oats towards the end of the month. There is no good reason against your dibbling the seed in holes seven or eight inches apart. If you do not dibble, you ought to drill the seed. Thin sowing is not to be recommended, except on land in very good condition.

Plant osiers and willows in moist situations. The red Huntingdon, or timber-sallow, is the best for ornament or shelter, round the cottager's garden, and is useful for many general purposes.

The ground should have been previously dug to a considerable depth, kept clean, and arranged in ridges.

Take cuttings fifteen inches long from two-year-old wood, and stick them into the ground two-thirds of their length, and at two feet apart every way.

MARCH.

Strong winds will now dry up the surface of the earth; but do not too hastily sow your seeds. The evaporation of moisture occasioned by the wind or the sun chills the ground considerably; observe the effects of it in wheat-plants, more especially on wet clay soils.

Finish draining for the season; there is no better month than the present for this work, because you will now be able to see in the strata of the drying soil where the springs rise, or rain-water escapes most readily.

Give the last turning to any composts that require pulverization and mixing, and are designed for spring crops.

Sow successions every fortnight of vetches in narrow drills, three bushels to the acre. One of the objects in sowing vetches being to smother growing weeds, and shade the surface so as to prevent the evaporation of moisture from it, there will be no bad result from over-seeding.

Dibble beans, and drill peas, in rows at least eighteen inches apart, as early in the month as the state of the soil will permit.

Plant more early potatoes.

Prepare your ground for barley and your main crop of potatoes at the close of the month, either by cross-ploughing the ribbed fallows, or by levelling and throughly pulverizing the soil to the depth of at least twelve inches, with the spade.

Prepare the land also for carrots and parsnips, and towards the end of the month harrow and roll wheat.

Ashes strewn over the surface will invigorate the plants and preserve them from the ravages of grubs and insects.

Top-dress clover with a sprinkling of lime or ashes. Where gypsum is obtainable, use it: it has a powerful effect on clover; chalk is also a manure very congenial with its nature. Hoe winter beans about the end of this month.

Take care of your ewes and lambs, and feed them abundantly.

APRIL.

Throughout this month sow barley. Experience proves that the early-sown corn yields better than that sown later, if the soil be in a fit condition to receive it. The favourite kinds of barley for a loamy soil in a fertile state are the Chevalier and Golden Drop, each of which

is very prolific under proper management. On inferior soils a coarser, hardier, and less weighty sort will be most suitable; for, poor land cannot nourish a stem able to bear a heavy ear.

It may not be amiss to remark, that plants brought from genial climates will not thrive on inferior soils and in cold climates; whereas, those which are taken from inferior soils and climates to better, improve. It should therefore be the care of cultivators to take advantage of this order of Providence.

There are hardy varieties of oats of established excellence in Scotland, such as the Angus or Hopetoun, which, for the reason just assigned, will be desirable for the English grower whose soil and climate may render the success of the finer kinds doubtful.

Provide the seed best suited to your land and climate, even if you pay what you may consider dearly for it. It is but the first cost, if you save your own seed afterwards. By observing due economy in sowing it, you will gain more than if you were to sow cheaper seed of less fruitfulness, or yielding grain for which the malster has no fancy. Seed that costs little is often wasted in the sowing, merely because it is cheap; and it must be sown more freely, if it be at all of uncertain germination.

Land cannot be too well prepared for barley; therefore a previous crop of manured roots, perfectly hoed and cleaned, will be the best preparation, not only for barley, but for clover-seed, which in most cases should be sown immediately after barley, and covered with a brush-harrow, but not rolled, unless in very light soil. The plants will come up freely between the drills of corn, and afterwards spread over the whole surface.

Some seeds preserve their germinating powers so long, that it is not necessary to have them fresh,—a matter of which seedsmen are well aware. Sow mangold-seed in drills, well manured, twenty-six inches apart, and drop the seeds on the top of the drill when levelled, ten inches apart.

Plant potatoes, but not so extensively as to depend on them for food—this failure may occur again.

In most cases the cottager plants the sets too thickly. The very early kinds may be in drills within twenty inches of each other, but for the late kinds there ought to be from two and a half to three feet between them.

The cultivator who depends entirely on his spade for preparing his land may sometimes find it difficult to dig the whole piece over in due time for commencing the planting of potatoes, Jerusalem artichokes, cabbages, and such other crops as are grown in drills, from two and a half to three feet asunder. In such cases he can dig, in the first instance, strips wide enough to receive his plants or seed, as the case may be; and afterwards, as time permits, and the necessities of the growing plants require, he can complete the digging. This, in potato planting especially, where circumstances may have unavoidably hindered the regular and early execution of the work, may be a useful hint.

Fresh stable-litter answers well for potatoes, and composts of any kind are also suited to them, and ashes from any vegetable matter are particularly suited to their wants. But in no case will they grow more luxuriantly or be better for the table than when grown on land previously limed, chalked, or marled, and lightly dunged at the time of planting.

It is a foolish thing to reserve the refuse of potatoes for seed, as the poor are sometimes tempted or obliged to do.

Endeavour to obtain seed potatoes of medium size, and of the best variety known in your locality.

MAY.

In the course of this month you will probably have completed the second hoeing of your wheat and winter beans. The first hoeing should have been executed in dry weather during the preceding months.

The greater regularity and ease with which drill crops can be hoed is one of the reasons why the broadcast system should be abandoned.

Weeds should never be permitted to grow through your crops; they not only exhaust the elements of fertility contained in the soil, but check the progress of the cultivated plants, and render the land foul for succeeding ones. Couch is a sad tormentor, which you should endeavour to get rid of. It particularly infests land which has been under successive and ill-hoed corn crops, and is, in fact, a wild wheat-plant, and called *Triticum repens*, from its creeping nature. Every joint or stole of it shoots forth like that of the convolvulus, which is the plague of gardens, and therefore it should be cleared out entirely: but without regular and frequent successions of green crops, it is impossible to get rid of it; with perfect culture, however, it disappears: its presence, therefore, is generally a certain proof of imperfect tillage. Char every atom of it when you have collected it, as the surest mode of destroying its vitality. In earlier seasons, however, it may be converted into mould by being mixed with lime, salt, or fresh seaweed, and laid in a large mass.

Lucern ought to be cultivated much more than it is on loose calcareous soils. Its exceeding value is well known in the chalk soils of Kent.

The ground should be well prepared for it by previous cleansing crops. It is sown broadcast in many places; but it ought to be sown in drills about sixteen inches apart, in order to admit of weeding. As it is tap-rooted, and will penetrate many feet into the soil, it is important to have a dry and free subsoil for it. The only objection to it on a very limited portion of land is, that wherever it is sown and established it usually remains there for ten or twelve years, thereby preventing rotations on the space it occupies. But it is so nutritious a plant, so greedily devoured by cattle and pigs, and so luxuriant in produce (yielding three or four cuttings in the season), that no occupier of deep loamy or any porous calcareous

soil should hesitate to give up some enclosed portion of land to it. In the driest weather, when all surrounding vegetation is withered, lucern is green and flourishing, absorbing the necessary moisture from the depths below.

The sowing of barley and clover may proceed in the beginning of the month, and you may still sow the long red or field carrot.

After the second hoeing of beans, rape-seed may be beneficially scattered over the ground as a bite for sheep in the autumn, which by their manure give an ample return for the trifling exhaustion of the land occasioned by the young rape-plants.

Sow another succession of vetches if wanted.

Roll wheat and every other crop that requires it, not omitting grass land.

Do not be tempted to turn out your cattle; feed them in house on the green rye and every sort of artificial and seasonable food that you can give them.

JUNE.

This is the favourite month for sowing Swedish turnips, which are greatly prized beyond all others for solidity and hardiness, and for the excellence of their leaves as greens in spring. Being tap-rooted, however, they require a deeper soil and more manure than the globe sorts; but they well repay the labour bestowed in the preparation of the ground, and the cost of dung, compost, and guano, which preserves them from the fly, and invigorates their growth more than any other application.

A sprinkling of soot, if guano be not obtainable, will prevent the fly from attacking the young plants: and ashes are a manure congenial with the nature of all turnips; but the solid and weighty Swede requires more nourishment than mere ashes can supply. If dung be scarce, bone manure is a good substance in aid. Let the crushed bones or dust be mixed with the dung, and

the mixture may thus be rendered sufficiently powerful to manure the required extent of ground.

Though potatoes will succeed with fresh litter as manure, turnips and mangolds will not; they (particularly turnips, which vegetate rapidly) require short well-rotted dung, or compost of dung and earth, almost in contact with the seed.

This is a good season for burning weeds and the under-soil of headlands, and peat, for any turnips or cabbage-seeds that are to be sown now or in the next month.

Sow a seedling bed of Swedes, common kale, or rape, according to the nature of your land and your future wants, to supply any vacancies that may arise from failures in your regular crops.

Consume as much of your vetches, clover, &c., in the green state as possible: thus will the mass of manure be increased.

JULY.

As fast as vetches are cleared away, break up the ground for stone turnips, or cabbages of the drum-head or large Strasburg kinds. Cabbages may succeed early potatoes if a little fresh manure can be afforded to them. Liquid manure will of itself be sufficient to insure the success of the crop, and there can be no better season for collecting it from the house-fed cattle than now, when succulent food for them is abundant. The cabbages of the above sorts ought to be put down four feet apart every way.

Cabbages, steamed or boiled, and mixed with salt and bran, will be found of real value for pigs and cattle; but they should always be given to the latter sparingly, either raw or after immersion in boiling water, which prevents flatulence; treated in this way, every part of them is eaten with avidity by the cattle. By putting a little nitre into the milk-pail before the milk is drawn, no bad flavour will taint the milk.

AUGUST.

The late potato plants should be kept very clean: in ordinary cases earthing is beneficial to potatoes, but in very thin soils, and especially if the drills be close, high moulding is impossible: if the spade or fork be sufficiently used for loosening the earth in the intervals between the drills, this is all they will now want. In land liable to the lodgment of water, high earthing is quite necessary, to form furrows as drains; but land so diseased is very unfit for the potato, or indeed for any other cultivated crop.

Turnips, when growing, are decidedly injured by having their bulbs earthed up; these require to be freed from the adhesion of earth.

The value of clover and lucern is now being experienced: "cut and come again," is their motto. A top-dressing of ashes, soot, or of lime and earth mixed, or a watering from the urine-tank, will stimulate them greatly: On them now chiefly depends the acquisition of solid and liquid manure.

It has been calculated that the liquid manure obtained from six cows is sufficient for an acre of land, without the addition of any other substance.

Reap, fag, or mow any ripe corn you may have, according to circumstances.

The ripeness of the straw indicates ripeness of the grain. But if you wait until the straw is wholly ripe, you may lose at least the uppermost grains (which are the fullest and best) from wind or rain. Wheat shrivels if cut before it is fully ripe.

Barley can stand much more ripeness than wheat, and should not be cut until the head droops completely and is crisp to the touch. Oats, having a strong husk, can bear a greater degree of ripeness, but, on the other hand, if they are over ripe, the heavy grains fall readily from wind and handling. Of the two extremes, it is better

to cut oats under-ripe, as the grain hardens and ripens in stock. But a sample of barley would be very inferior in colour and plumpness, if cut too soon; in this respect it is more delicate than even wheat.

Cut, then, if you can, just before the uppermost grain can be shaken out by wind or rain. Experience alone will teach you when any sort of grain is fully ripe.

SEPTEMBER.

Reaping and harvesting will be still your seasonable occupations.

On stubble land, in clean and good condition, the seed or plant of the clover tribe may now be sown; no ploughing is necessary for it, the harrow or rake (the latter for the cottager) will cover the seed and open the soil sufficiently. From fourteen to twenty pounds is a sufficiency of seed for the acre. Where the spring-sown clover has failed in patches, *Trifolium incarnatum* should be sown; this will not only prevent the occupation of the waste spaces by weeds, but supply a valuable substitute for the clover. This hint is well worth acting upon where partial failure of clover has disappointed and embarrassed the cultivator.

Every early kind of the potato will have been long since ripe. Those tubers which have been left in the ground for next year's supply of seed, should be taken up when the soil about them is dry, and either laid in a dark cellar on a dry floor, or collected on a dry spot of the field, rather raised above the level of the surface than sunk below it in a trench, as is the too common practice. Towards the end of the month, some of the late kinds will be fit for securing in the same manner; but care should always be taken not to lift the potato crop for stacking or storing unless it be quite ripe, that is, until the haulms are perfectly withered, and the tubers readily fall off from the roots.

Some persons who have but a small portion of field

under the potato crop, place a layer of reeds or sedge over it during the winter to guard it against frost; and where winters are mild, this is a better plan on very absorbent soils than stacking the potatoes in heaps, in which they often become rotted.

Pull the drooping leaves of cattle-beet for cows and pigs.

OCTOBER.

Dibbling of Wheat.

The dibbling of wheat cannot be too strongly recommended where labourers are numerous, and the cry for employment consequently urgent. On a very minute scale, the practicability and economy of this mode of sowing cannot be denied; and experience is beginning to show that dibbling may be executed most beneficially on a large scale too. In one of the allotment gardens of Horsham, one-eighth of an acre was divided into two equal parts; one part was sown broadcast with wheat at the rate of two bushels of seed to the acre; the other was sown with seed dibbled at the rate of two gallons to the acre. The part dibbled produced at the rate of thirteen sacks to the acre; the other produced at the rate of only ten sacks to the acre.

On a very large scale one-third more of produce has been obtained, on an average of ten years, from dibbled than from broadcast-sown wheat.

The practice, however, of thin sowing is only to be recommended on land in a high state of fertility and tilth. In such favourable case, the holes for wheat may be made fifteen or sixteen inches apart every way: seven or eight grains may be dropped in each hole; experiments, however, have shown that the greatest produce has been obtained when five grains were sown in each hole, the distances being the same in the different cases. The facility of hoeing between the plants, and thus promoting

their free tillering, and of weeding the ground, is a principal benefit obtained by dibbling.

The most efficacious and safe steep for the seed is sulphate of soda and lime. Next to this, steeping the grain in salt pickle, strong enough to bear up an egg, is to be recommended.

Harvest your late potatoes when the haulm is quite withered, and the land is in a dry state for forking out the crop. The practice of making a pit for the tubers in the field should be abandoned. They should be laid rather on a raised platform than on a sunk bed, in order to keep them dry. The withered stalks, even if free from disease, should not be laid over the tubers, as they soon become damp and mouldy. A covering of earth alone over the heap of tubers (which will be the better for a sprinkling of dry coal-ashes) will be a sufficient protection for them. A dry floor, however, in a cool situation, and without light, is preferable for them to any sort of heaping in the field. Tainted should be carefully removed from sound tubers.

Cattle and Pigs

Will derive much food this month from cabbages, which may be considered the first course of the winter dietary. Towards the end of the month, turnips, and the large leaves of cattle beet and the tops of carrots and parsnips, should be added to their fare.

The tailings of corn and fresh barley-meal will prepare porkers for the table.

NOVEMBER.

Where wheat-sowing on clay land is still going on, it is of great importance to take advantage of a dry state of soil, as the treading of the land when wet is very injurious. It is better to postpone all sowing until

the weather be favourable: forcing a season is rarely attended with success.

A heavy covering of the seed is thought to give the future roots more fixity in the earth, and more vigour to the plants than light covering; but from one and a half to three inches of earth—according to the nature of the soil—is a sufficient depth for grains of wheat. The lengthening of stem below the surface gives no additional fixity to the roots, which naturally take a due hold of the soil, even though the seed be very near the surface; the downward tendency of the roots, and the upward tendency of the stem, are matters of certainty if the grain grows.

Dig out carrots, parsnips, and cattle-beet. As earth about the bulbs of your Swedes will now serve to guard them from injury by frost, the plough or hoe should be used to mould them: this operation will also form clear furrows to carry off water from them.

Draining.

Draining of every description should now be carried on when the weather permits. This is the time for thus preparing for next year's cropping. If this work be neglected, under any pretence, where it is necessary, a poor harvest from the undrained soil may deservedly be the return next year. If the land be worth cultivating at all, it should be treated in the best manner. The occupier of land diseased from moisture, who has the means of draining and yet will not drain, does not deserve to prosper.

DECEMBER.

Draw turnips and house them when you can, in order to have a sufficient supply for the cattle in case of very severe weather, which would render the lifting of the turnips, day by day, difficult.

Wheat may still be sown in open weather on land which could not be prepared at an earlier period.

Commence the ploughing of ley; its exposure to winter frosts will greatly promote its decomposition.

Continue or commence to dig, if you cultivate by spade labour, every pole of ground which you want for spring crops.

Subsoil or trench as much of your land as you possibly can.

If you find that heavy rain washes the finer particles of earth from the higher to the lower parts of a fallow, by the furrows, take this as a hint to drain the land immediately. With a free subsoil, this washing away of the surface will not take place in any part, unless it be very much inclined; the rain will filter downwards where it falls, and fertilize the surface equally.

Collect the earth of ditches and headlands for mixing with fermenting manure, or with quick-lime, or sea-sand and sea-weed.

In the vicinity of the sea-coast, the farmer looks for some of the precious treasures of the ocean as the chief sources of his manure. A bed of sand or mould should be collected to receive the juices of "the fat sea-weed," when storms wrench it from its natural bed, and drive it on shore for our benefit. Everything that can be converted into manure should be industriously collected, and the short day hours of this month, when the earth is almost at rest, should be unceasingly employed in such field labours as the weather may permit to be executed.

The trimming and plashing, or cutting down of old straggling hedges, and faggoting, will be among the out-of-door labours; and threshing, winnowing, chaff-cutting, and the repairing of implements, will give full employment within-doors.

The farmer or cottager who has grown flax for domestic use, will find some work in preparing it for the hackle, and after it has been hackled, some of the females of his family will find amusement and occupation in

spinning it for linen, when they have nothing better to do.

The bruising of furze for horses and cattle will be found highly beneficial where economy of hay and straw is important.

Milch cows thrive well on it, and it renders horses sleek; but being of a relaxing nature, oats should be given alternately with a feed of furze to them.

END OF VOL. I.

PRINTED BY COX AND WYMAN, GREAT QUEEN-STREET.